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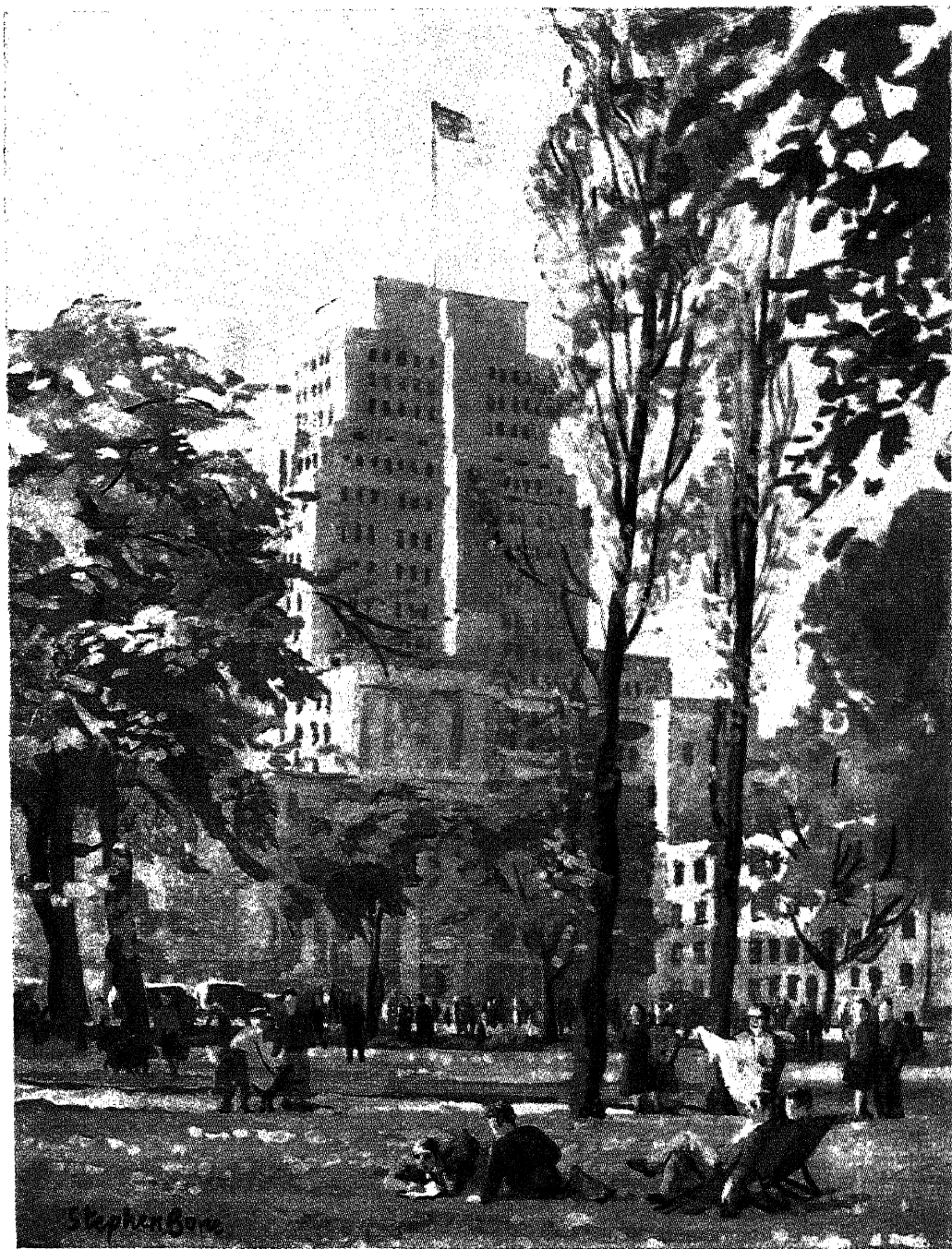
The New
UNIVERSAL
Encyclopedia



Volume 6



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Specially painted for the New Universal by Stephen Bone

LONDON UNIVERSITY, largest in the world, with over 50,000 students, internal and external, saw its great central administration building in Bloomsbury completed in 1938. Through the war years it housed the ministry of Information. The tower contains the library.

The New UNIVERSAL Encyclopedia

Edited by

Sir John Hammerton

*Editor of The Universal History of the World,
The Second Great War, etc.*

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HUNT-LOGG

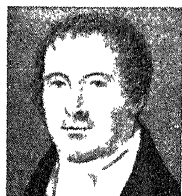


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Hunt. The name used in Great Britain for an association of men who maintain dogs with which to hunt the fox, otter, or other animal, over a certain district. Hunts in England include the Belvoir, Meynell, Quorn, Pytchley, etc. At the head is the master, usually a landowner or other person of importance; of the paid servants the chief is the huntsman, who has whippers-in and other assistants. The pack of hounds is maintained in kennels at some central spot, and is usually supported by subscription, although some packs are the private property of the master, who meets all expenses. See Foxhunting.

Hunt, ALFRED WILLIAM (1830-96). A British painter. Born at Liverpool, Nov. 15, 1830, he was educated at Liverpool College and Oxford, where he became a fellow of Corpus Christi College. In 1854 the success of a small landscape at the Royal Academy decided him to adopt a painter's career. In 1864 he was elected a member of the Old Water Colour Society. His chief successes were water colours. He is remarkable for his minuteness in observing nature and his delicate precision in recording it, and his pictures have been much sought after by collectors. He died May 3, 1896.

Hunt, HENRY (1773-1835). A British politician. He was born at Upavon, Wiltshire, Nov. 6, 1773,



Henry Hunt,
British politician

where his father was a farmer and landholder. He engaged in farming, but joined the radical reformers. He had been twice in prison when he unsuccessfully contested Bristol in 1812; first in 1800 for challenging the colonel of his yeomanry troop to a duel, and again in 1810 for assaulting a gamekeeper. From 1816 he was a prominent speaker at reform demonstrations in London, and he presided at the similar meeting in St. Peter's Fields, known as Peterloo (*q.v.*), at Manchester, Aug., 1819.

Imprisoned for two years in Ilchester gaol for his share in the Peterloo meeting, he was elected M.P. for Preston in 1830, but, defeated in 1833, gave up politics to become a blacking manufacturer. Known as Orator Hunt, he died at Alesford, Hants, Feb. 15, 1835. See *Memoirs, Henry Hunt*, 1820.

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Hunt, JAMES HENRY LEIGH (1784-1859). The British writer known as Leigh Hunt. Born at Southgate, near London, Oct. 19, 1784, he was educated at Christ's Hospital. He was first clerk to an attorney, and later in the War office. This he left in 1808 to join his brother John in the conduct of a weekly newspaper, *The Examiner*. He had already been doing a certain amount of journalistic work, notably dramatic criticism for *The News*, an unsuccessful venture of his brother's. Leigh Hunt acted as editor of the new paper, the radical views of which brought it several times into conflict with the authorities; in 1813 he was sentenced to two years' imprisonment and a fine of £500 for libelling the Prince Regent. During his imprisonment he was visited by Moore, Byron, and other sympathisers, and wrote the narrative poem *The Story of Rimini*.

In 1821 a proposal was mooted by Byron and Shelley for the establishment of a new quarterly magazine in which Hunt should cooperate, and in the following year Hunt with his wife and seven children arrived in Italy, where Byron and Shelley were staying. Within a week, Shelley had been drowned; Byron and Hunt proved antipathetic, and the new magazine died with the fourth number. The Hunt family returned to London in 1825; and in 1828 appeared Lord Byron and *Some of his Contemporaries*; the book is now regarded as of great historical interest, but its publication at the time was regarded as a breach of good taste. For the rest of his life Hunt was continuously engaged in journalistic and literary

work, but owing to his unbusiness-like ways he was in constant debt. In 1847 he received a civil list pension of £200 a year. He died at Putney, Aug. 28, 1859.

Others of his works were *The Feast of the Poets*, 1814, *Wit and Humour*, 1846, and an admirable *Autobiography*, 1850. Charming though much of Leigh Hunt's poetry is, he lives by his prose writings, illuminated by delightful humour and fancy. Dickens was surprised that Hunt was upset by the admitted likeness of Skimpole in *Bleak House* to himself, and promptly changed that character's first name from Leonard to Harold. See *Pre-Raphaelites*; consult also *Life of Leigh Hunt*, C. Monkhouse, 1893; *L. H.'s Relations with Byron, Shelley, and Keats*, B. Miller, 1910; *Life, E. Blunden*, 1930.



Leigh Hunt

Hunt, WILLIAM HOLMAN (1827-1910). A British painter. Born in London, April 2, 1827, he was the son of a city warehouseman, was educated for commercial life, and began work as an assistant to an estate agent. He began to study art in the British Museum and the National Gallery in 1843, entering the Royal Academy Schools the following year. There he formed the friendship with Millais which lasted a lifetime. He began to exhibit at the Academy in 1846.

In 1848 his *Madeline* and *Porphyro* attracted the attention of Rossetti, who asked that Hunt be allowed to work under him. The same autumn, Hunt, Millais, and Rossetti founded the *Pre-Raphaelite Brotherhood* (*q.v.*). Hunt alone maintained the original precepts and technical methods of the Brotherhood throughout life.

His strong religious convictions were revealed in many of his pictures. Ruskin, another lifelong friend, welcomed in him a religious passion hitherto unknown in British art. Hunt made three journeys to Palestine, to paint Biblical and Eastern subjects with absolute



W. Holman Hunt,
British painter

fidelity. He also visited Italy, Greece, and Egypt. In 1856 he offered himself as candidate for A.R.A., but received only one vote.

Hunt's best-known paintings include *The Hireling Shepherd*, *The Finding of Christ in the Temple*, *Valentine and Sylvia* (Birmingham), *The Shadow of Death* (Manchester), *Christian Priests escaping from Druid Persecution*, *The Triumph of the*

Millet at Paris. He returned to the U.S.A. in 1855, and settled at Boston. An apostle of the Romantic school, he found the American public antagonistic to his theories, and his life was nearly ended when he was commissioned to execute the mural paintings in the Capitol at Albany, by which he is best remembered. At Boston he preached his views to a large number of pupils, and in 1875 embodied them in a book, *Talks on Art*. Portraits, genre, history, and landscape were all subjects for his clever if eccentric brush. His portrait of Lincoln and *View of Gloucester Harbour* are notable. He was drowned Sept. 8, 1879.

Hunt Cup, ROYAL. Handicap horse-race. Instituted in 1843, it is an annual event run at Ascot on the Wednesday of the meeting, held in the third week of June. The course is 7 furlongs 166 yards long, straight, and uphill all the way. In 1862 the record number of 37 horses came under the starter's orders, and in 1919 the 4-yr.-old Irish Elegance won with 9 st. 11 lb. in the saddle, the highest weight carried to victory. No horse has won the race more than once. In the years 1915-18 and 1940-44 there was no race.

Hunter. River of New South Wales, Australia. It rises in the Liverpool Range, flows almost due S. to join the Goulburn, then the joint stream flows S.E. to the coast, where on the estuary lies the port of Newcastle. The lower valley is fertile but subject to serious inundations. Shortland discovered coal near the mouth of the river in 1796. Its length is 300 m.

Hunter, SIR ARCHIBALD (1856-1936). A British soldier. Born Sept. 6, 1856, he was educated at Glasgow academy and Sandhurst, and commissioned in the Royal Lancaster Regiment in 1874. Following service in India and Egypt, he became commandant of the frontier field force in Egypt in 1894, and at the battle of Omdurman in 1898 commanded the British div. As Kitchener's chief lieutenant, he was responsible for the defence of Egypt while the former was preparing to recover the Sudan. He commanded the 10th div. at the relief of Mafeking, 1900-01. Promoted full general in 1905, he commanded the Southern army of India 1907-09, was governor of Gibraltar 1910-1913, and held the Aldershot command 1914-1917. He retired from the army in 1918. He was M.P. for Lancaster 1918-22. Died June 28, 1936.

Hunter, JOHN (1728-93). British surgeon and anatomist. Born at Long Calderwood, Lanarkshire, Feb. 13, 1728, he lost his father when he was ten years old, and, owing to indulgence by his mother, his education was of the slightest. When 17 he managed the cabinet-making business of a step-brother at Glasgow, acquiring a high degree of manual dexterity. He journeyed on horseback to London and became assistant to his brother William (*v.i.*), studied surgery at Chelsea under Cheseldon, and at S. Bartholomew's under Percivall Pott. He was house surgeon at S. George's, 1756; surgeon, 1768; student at S. Mary Hall, Oxford, 1755-56; and accompanied military expeditions to Belleisle, 1761, as staff surgeon to Keppel, and with the British army to Portugal, 1762.

John Hunter,
British surgeon

He began private practice in Golden Square, London, 1763; had Edward Jenner as pupil, during 1770-72; was elected F.R.S., 1767; began to lecture, 1773; and was surgeon-extraordinary to George III, 1776. He built an anatomical museum in Leicester Square, 1784-85; began his operation for the cure of aneurism, 1785, and was appointed surgeon-general, 1790. He died suddenly in S. George's Hospital, Oct. 16, 1793, and was buried in the church of S. Martin-in-the-Fields, whence, in March, 1859, his remains were removed to Westminster Abbey. In 1771 he married Anne Home (1742-1821), author of *My mother-bids me bind my hair*, and several other well-known songs.

Hunter was not only an anatomist; he was distinguished in surgery, biology, physic, and pathology, and was a keen student of nature. His pupil and brother-in-law, Sir Everard Home (who edited his *Treatise on the Blood, Inflammation, and Gunshot Wounds*, first published in 1794), destroyed Hunter's MSS. some 30 years after Hunter's death, having in the meantime made extensive use of them. Hunter's other works include studies *On the Venereal Disease*, 1786; *Observations on Certain Parts of the Animal Oeconomy*, 1786; *Observations and Reflections on Geology*, 1859,



W. Holman Hunt. *The Light of the World*, the best known of this artist's masterpieces
Keeble College, Oxford

Innocents (Liverpool), and *The Light of the World* (Keeble Coll., Oxford, with replica in S. Paul's Cathedral). Much of his colour has a harsh enamel-like quality, and there is a tendency to elaborate detail at the expense of artistic unity. But in his own lifetime he was highly esteemed both as man and as artist. He was awarded the O.M. in 1905. In the same year he published his *Pre-Raphaelitism* and the P.R.B., which was virtually an autobiography. Twice married, his wives being sisters, he died in London, Sept. 7, 1910, and his ashes lie in the crypt of S. Paul's. Consult W. H. H., A. C. Grimes, 1936; *The Pre-Raphaelite Tragedy*, W. Gaunt, 1942.

Hunt, WILLIAM MORRIS (1824-79). American painter. Born at Brattleboro, Vermont, March 31, 1824, he studied at Düsseldorf, 1846, and under Couture and J. F.

intended as introduction to the catalogue of his fossil collection; and Memoranda on Vegetation, 1860. His collection of over 10,000 specimens (two-thirds destroyed by enemy air action in the Second Great War) was bought by the nation in 1795 for £15,000, and presented to the Royal College of Surgeons, London, in connexion with which the annual Hunterian Oration was inaugurated in 1813. *Consult Works*, 4 vols., ed. J. F. Palmer, 1835-37; Lives, D. Otley, 1835; S. Paget, 1897; Two Great Scotsmen, W. and J. Hunter, G. R. Mather, 1894; John and William Hunter, J. M. Oppenheimer, 1947.

His brother William (1718-83) was born at Long Calderwood, May 23, 1718, and educated at Glasgow university, at Edinburgh, and at S. George's Hospital. He was surgeon-ac-coucheur to Middlesex, 1748, and physician-extra-ordinary to Queen Charlotte, 1764. He was made F.R.S., 1767, and became first professor of anatomy, Royal Academy, 1768; and formed an immense collection of specimens, books, and art objects which he left to Glasgow university. He died March 30, 1783. His chief work was *Anatomy of the Human Gravid Uterus*, 1774, in Latin, 2nd ed. by E. Rigby, 1843. *Consult Lives*, S. F. Simmons, 1783; R. H. Fox, 1901.

Hunter, Sir William Wilson (1840-1900). British historian and statistician. Born at Aberdeen, July 15, 1840, he became under-secretary to the government of India in 1871, and as director-general of statistics planned and executed in the years 1869-85 a statistical survey of India in 28

vols., condensed 1881 into the *Imperial Gazetteer of India*. He was president of the Indian education commission, 1882, and a member of the Viceroy's council, 1881-87. Knighted in 1887, he died on Feb. 6, 1900.

Amongst his numerous works are *Comparative Dictionary of Non-Aryan Languages of India*, 1868; *The Indian Empire, Its People, History, and Products*, 1882; *Dalhousie*, 1890. He collected material for an exhaustive *History of British India* in 5 vols., only two of which were completed, and edited the *Rulers of India* series 1890-95.

Hunterian Society. Medical society founded in London in 1819, to honour the work of John Hunter. Meetings, some of them dinner meetings, are held at the Mansion House or some city company hall, at which a subject of public medical interest is discussed. The public is admitted and invited to participate. The society awards annually a gold medal for the best essay by a medical practitioner embodying the results of his own observations.

Hunter's Moon. Month or moon next following the harvest moon, which in turn is that which is full on the date nearest the autumnal equinox, the time of harvest. The hunter's moon is so called because hunting begins when the harvest has been gathered in.

Hunting. In its widest sense, the pursuit of anything for gain or sport. It was first a necessity of man's existence, as only by hunting or fishing could he obtain the food necessary to maintain life. He probably used snares to aid his primitive weapons, but a great advance in the practice of hunting came with the invention of the bow and arrow. Centuries of this life made hunting very deeply seated in human experience, and when the necessity for it as a means of livelihood had passed away it remained as an almost universal sport. In certain parts of the world today it still combines both aspects.

Hunting became less imperative with the acquisition of property in cattle and the growth of the practice of cultivating the ground, while owing to man's activities in these and other directions the areas available for it were greatly curtailed, and the number of wild animals greatly reduced.

Hunting was a sport with the Egyptians and other ancient peoples, as it was with the Greeks and Romans. A great variety of animals were hunted, from the lion to the hare, and the value of the dog as an aid to the hunter was early discovered. The English, led by their kings, appear to have been remarkably fond of it, the deer being perhaps their favourite

quarry, while in France it was treated as an art. Edward the Confessor loved it, and William the Conqueror's passion for it was notorious. In a later age it was a prime recreation with Henry VIII, Henry IV of France, and Elizabeth.

At the present day in England and Ireland hunting refers mainly to the pursuit of the fox, but it is also used for that of red deer and the otter. In Scotland the pursuit of the wild stag is more generally called stalking. In other parts of the world other animals are hunted, e.g. the tiger in India and the lion in Africa, while wherever the deer or animals of that type are found there is hunting. *See Big Game; Coursing; Deer-stalking; Forest; Foxhunting; Game Laws; Shooting.*

Hunting. In mechanical engineering, term to indicate variations of speed of an engine when the governor is not controlling it efficiently. When an engine is hunting its speed continuously fluctuates between fast and slow. The term is also applied to the periodic departures from, or oscillations about, the mean speed of an engine-driven alternator or synchronous motor. It is seldom experienced in motors driven by steam turbines or hydraulic power.

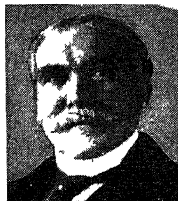
In an automatic telephone exchange, a selector is said to be hunting while it is seeking a free outlet in order to connect a calling line. *See Telephone.*

Hunting Dog. Species of wild dog. Found in S. and E. Africa, it resembles a hyaena in appearance, and hunts in packs. *See Cape Hunting Dog.*

Huntingdon. Mun: bor., market town, and co. town of Huntingdonshire, England. It stands on the left bank of the river Ouse, 59 m. from King's Cross, London, and is a rly. junction. Across the river is Godmanchester, the two being connected by a stone bridge dated 1332, while near is Hinchbrook House, the old residence of the Cromwells. The chief churches are those of All Saints and S. Mary, both old buildings restored. There are a town hall, etc. The grammar school was rebuilt on a new site 1939. Other notable buildings are Cromwell House, the successor of the one in which the Protector was born, and the George, a coaching inn with its old galleried courtyard.



William Hunter,
British surgeon
After Reynolds



Sir W. W. Hunter,
British historian

Elliott & Fry



Huntingdon
arms



Huntingdon. View of the High Street, looking east. The spire is that of Holy Trinity church

Earthworks remain of a castle built by order of William I. There was a priory here at an early date, and a hospital founded by David I, king of Scotland. The town was incorporated in 1483, and is now governed by a mayor and corporation. Pop. 4,108.

Huntingdon, EARL OF. British title borne by the family of Hastings, since 1529. Under the Normans Huntingdon was an outlying part of Northumbria, and later its earl was the king of Scotland. About 1336 it was separated from Scotland, and William Clinton was made earl; afterwards the title and honours were held in succession by the two great families of Holland (or Holland) and Grey.

In 1529, George, Lord Hastings, grandson of that Lord Hastings who was put to death by Richard III, was made earl of Huntingdon by Henry VIII. His son Francis, the 2nd earl, was prominent in public life, and from him the title passed down to Theophilus, the 7th earl, a supporter of James II, both before and after his loss of the throne. A later Theophilus, the 9th earl, was the husband of Selina, countess of Huntingdon, and after the death of their son Francis in 1789 a descendant of the 2nd earl took the title. In 1818 his nephew was declared its rightful possessor. From him the present earl is descended. The earl's eldest son is called Viscount Hastings.

Huntingdon's Connexion, THE COUNTESS OF. Religious movement

founded by Selina Hastings, countess of Huntingdon (1707-91). It sprang up within the Church of England. The countess, daughter of the 2nd Earl



Selina Hastings, Countess of Huntingdon

Howel Harris (*q.v.*) and others, she opened a college for the training of young ministers. Whitefield officiated at the opening ceremony, for which William Williams wrote in Welsh the hymn, Guide Me, O Thou Great Jehovah. From 1781 the movement was allied to Dissent under the Toleration Act (*q.v.*).

Shortly before the death of the countess a trust was formed for the management of the college. On Aug. 24, 1792, the institution was removed to Cheshunt, and in 1905 to Cambridge. All the students are members of the university, and, though the majority enter the Congregational ministry, they are left entirely free in their choice. The college is now quite separated from the Connexion, but the connexional trust is represented on the governing board.

By a trust deed sanctioned by the court of chancery, Jan. 1, 1899, 40 chapels and mission stations were then in association. The offices of the Connexion are at Huntingdon Lodge, Wormley, Hoddesdon, Herts.

Huntingdonshire OR HUNTS. South-midland county of England. The county slopes generally from the undulating hilly edges of the midland plain on the W. to the valley of the Ouse, or to the

Ferrers, was influenced by the brothers Wesley, and after the death of her two sons in 1743, and of her husband, the 9th earl of Huntingdon, in 1746, devoted herself to the spread of evangelical religion.

On Aug. 24, 1768, at Trevecca House, Talgarth, South Wales, with the help of

low levels of the Fens. The high ground is arable, while the hedgeless, dyke-bounded fields of the tenland are devoted to heavy crops of wheat or roots. The Nene forms the co. boundary in the N. and the Great Ouse crosses the S. of the co. Boulder clay and gravel rest upon Oxford clay, except in the Fens, where the surface is alluvium; the boulder clay is cultivated for cereals, and the drift of the valleys forms rich meadows.

With much permanent pasture, an increasing area is devoted to wheat; barley and root crops come next in importance. Brewing, brick and paper making, and flour milling are the main industries. The county is well served by main railways. Huntingdon, the county town, Godmanchester, St. Ives, and St. Neots are the chief of the numerous small towns. The co. forms one co. constituency. Area, 366 sq. m. Pop. 56,206.

HISTORIC ASSOCIATIONS. Henry of Huntingdon, in the 12th century, wrote a history of England to 1154, and other works. Oliver



Huntingdonshire. Map of this English south-midland county, chiefly agricultural and pastoral in character

Cromwell was born at Huntingdon. Brampton disputes with London the distinction of being the birthplace of the diarist, Samuel Pepys. Sir Robert Cotton, the 17th century antiquary, was born

at Denton. Cowper lived for two years with the Unwins at Huntingdon. Little Gidding, the home of the Ferrars of the 17th century, has a notable place in J. H. Short-house's novel John Inglesant. Consult History of Huntingdonshire, R. Carruthers, 1824; The Place-Names of Huntingdonshire, W. W. Skeat, 1844; Huntingdonshire, W. M. Noble, 1911.

Huntington. City of Indiana, U.S.A., the co. seat of Huntington co. It stands on the Little Wabash river, 25 m. S.W. of Fort Wayne, and is served by the Erie, etc., rlys. The industrial centre of an agricultural area, it ships wheat and other grains, maize, and sugar beet, and has rly. shops, meat-packing plant, creameries, cement works, printing and publishing plants, and factories producing brake linings, cranes and shovels, rubber and sporting goods, chemicals, cedar chests, and radio cabinets. Huntington was settled in 1834, incorporated in 1848, and became a city in 1873. Pop. 13,903.

Huntington. A town of New York State, U.S.A., in Suffolk co. on Long I. It stands on an inlet of Long Island Sound, 35 m. E.N.E. of New York, of which it is a residential suburb, and is served by the Long Island rly. It includes several villages, among them Northport and Cold Spring Harbour, which is the site of a state fish hatchery, and the laboratories of the Carnegie institute's department of genetics. Oyster fishing, market gardening, and shipbuilding are carried on, but Huntington is chiefly the trade centre for the surrounding area in which wealthy residents of New York have large estates. Walt Whitman was born and lived here. Pop. 31,768.

Huntington. A city of W. Virginia, U.S.A., the co. seat of Cabell co. It stands on the Ohio river, 50 m. W. of Charleston, and is served by the Chesapeake and Ohio and the Baltimore and Ohio rlys, and an airport. It contains Marshall College, the U.S.A. district engineer's office, a veterans' hospital, and a state hospital for the insane. It is the centre of a bituminous coal and natural gas region, and of a farming area which produces tobacco and apples. There are rly. and locomotive repair shops, factories producing mine cars, steel rails, nickel and alloys, glass containers, thermos flasks, furniture, and oxygen as well as foundries and breweries. Huntington was founded in 1869 and incorporated two years later. Pop. 78,836.

Huntingtower. Castle of Perthshire, Scotland. It stands on the Almond, 3 m. N.W. of Perth.



Huntingtower, Perthshire. The ancient castle, scene of the Gowrie conspiracy

Formerly called Ruthven, it was renamed Huntingtower after the "raid of Ruthven," in which the young king James VI was kidnapped by the 1st earl of Gowrie, 1582. This is dramatically described in Scott's *Tales of a Grandfather*. The castle is also the scene of John Buchan's novel *Huntingtower*. There are extensive bleach works, an 18th century establishment. See Gowrie, Earl of.

Huntly. A police burgh and parish of Aberdeenshire, Scotland. It is 41 m. N.W. of Aberdeen on the railway. Lying at the junction of the Deveron and the Bogie, Huntly is the chief town in Strathbogie, and has an agricultural trade, and hosiery and agricultural implement industries. Huntly castle (known as Strathbogie until 1544), seat of the Gordon family, was built in the 13th century, destroyed in 1594, and restored in 1602; it is now in ruins. George Macdonald, novelist and critic, was a native of Huntly. Market day, Wed. Pop. 4,579.

Huntly, MARQUESS OF. Scottish title borne by the family of Gordon since 1599. In 1449 Alexander Seton, a lord of Gordon, was made earl of Huntly. His mother was the daughter and heiress of Sir Adam Gordon, who was killed in 1402, and his successors took the name of Gordon instead of Seton. The title passed to his son and other descendants. Alexander, the 3rd earl, was a very powerful nobleman in the early 16th century, while he and later earls became great landholders in Aberdeenshire and thereabouts. George, the 4th earl, lost his life and his title for rebelling against Mary. The title was restored to his son George, the 5th earl, a relative of Bothwell. Father and son both became lord chancellor of Scotland.

The 6th earl, George Gordon (1562-1636), was prominent in the time of James VI. In 1589 he rebelled against that king, and again in 1594. More than once he was found corresponding with the Spanish court against his own king. However, not only was he pardoned, but in 1599 he was made a marquess and lieutenant of the north, but he was a prisoner more than once before his death, June 13, 1636.

Huntly's son George, the 2nd marquess, was a royalist during the Civil War, for which he was executed by the Scottish parliament in 1649. This meant his attainder with loss of his titles, but these were restored formally to his son Charles in 1661. George, the 4th marquess (1643-1716), was made duke of Gordon in 1684, a title held by his descendants, together with that of marquess of Huntly, until its extinction in 1836. The marquessate then passed to a distant relative, George Gordon (1761-1853), a descendant of the 2nd marquess. He was already earl of Aboyne, and his son and grandson succeeded in turn to the titles, which included a barony of the United Kingdom—that of Meldrum—dating from 1815. Aboyne Castle, Aberdeenshire, sold by the 11th marquess in 1922, was bought back by the 12th. The marquess of Huntly is the premier marquess of Scotland.

Hunyadi, JÁNOS CORVINUS (c. 1387-1456). Hungarian soldier. Of gentle birth, he saw military service as a young man under Sigismund, taking part in the Hussite war of 1420. He thus acquired royal favour and in 1438 was made ban of Szoreny, a difficult position on account of its proximity to the warlike Turks. In 1440, the throne of Hungary being vacant, he espoused the cause of Wladislaw of Poland, whom he established on the throne. The next few years he was occupied in resisting the Turks, advancing into their country in 1443.

In conjunction with a large force furnished by the pope he engaged in another campaign against the Turks but, betrayed by his Serbian ally, Brankovich, he suffered an overwhelming defeat at Varna, 1444, in which Wladislaw was killed. Eighteen months later Hunyadi was elected governor of Hungary in the absence of King Ladislas V, who, until 1453, was the prisoner of Frederick III of Germany. During this time he continued his wars against the Turks with varying success, losing the day at Kossovo, 1448, but raising the siege of Belgrade, July,

1456, a campaign which cost him his life, as he died of plague, Aug. 11, 1456.

Huon, GULF OF. Inlet of the N.E. coast of New Guinea. Penetrating 50 m. inland, it has several good harbours and numerous small islands. The gulf is 100 m. wide at its entrance. The Markham river enters the gulf at its head. On it lie Lae and Salamaua, Japanese bases in the Second Great War, and centres of fierce fighting. See New Guinea; Pacific War.

Huon Pine (*Dacrydium franklinii*). Tall evergreen tree of the family Coniferae. It is a native of Tasmania, related to the yew. The scale-like leaves overlap. It attains a height of 100 ft., and the close-grained wood is both beautiful and useful, and has an aromatic odour.

Hupei. Prov. of central China. It lies in the Yang-tse valley. Area, 71,955 square miles. Pop. 24,658,988. It contains 70 counties and two municipalities, with Wuchang as its capital. The most important cities are Hankow, Wuchang, Hanyang (collectively known as the Wuhan cities), Siangyang, Ichang, and Enshih. The Pekin-Hankow rlys. and the Canton-Hankow rlys. run through the province from N. to S. There are numerous navigable rivers and lakes. The principal products are rice (it is one of the "rice bowl" provinces), cotton, wheat, tea, iron, and tobacco. The rlys., and wide areas bordering them, were occupied by the Japanese during the so-called "China incident" (1937-1945).

Hurdle Race. Horse race under the National Hunt Committee's rules. No hurdle race is of a less distance than 2 m. except those confined to 3-yr.-olds between Sept. 1 and Dec. 31 inclusive, which may be run over a minimum distance of $1\frac{1}{2}$ m. In all hurdle races there must be not less than six flights of hurdles in the first $1\frac{1}{2}$ m. with an additional hurdle for each $\frac{1}{4}$ m., or part of one, above that distance. The hurdles may not be lower than 3 ft. 6 ins. from bottom to top bar. See Steeplechasing.

Hurdling. Event in athletics. One of the most attractive items in an athletic programme, hurdling races are usually run over a track 120 yds. long, but occasionally over longer distances up to 440 yds. In the 120 yds. sprint the hurdles, which are 3 ft. 6 ins. high, and have level top-rails, are placed 10 yds. apart, the first being set up 15 yds. from the starting-point,

but in longer races the distance between hurdles, which are lower, varies from 20 yds. to $38\frac{1}{2}$ yds. The chief art in hurdling is just to clear the obstacle and retain the stride in doing so. For British hurdling see Athletics.

Hurdy-Gurdy. Stringed instrument, varying in shape from the lute to the guitar, or viol. The sounds are produced by a rosined wheel rubbing against the strings. A keyboard assists in "stopping" the melody strings, and other strings supply a drone bass, in bagpipe fashion. Portable hurdy-gurdies, each enclosed in a box and worked by a rotating handle, were once a favourite instrument of itinerant street musicians, or "organ grinders." See Viol.

Hurlford. Town of Ayrshire, Scotland. It stands on the Irvine, 2 m. S. by E. of Kilmarnock, on the railway. There are iron, fireclay, and worsted industries, and collieries near. Pop. 6,000.

Hurling OR HURLEY. An Irish game played with crooked sticks or clubs and a ball. It is played in a similar manner to hockey, but is of much earlier origin, and is thought to have been originally a game for individual opponents. The English game of hockey is a product of hurling, itself often regarded as a variation of polo. In hurling each side consists of an equal number of players who may knock or carry the ball with the "hurley," but may not handle it.

Hurlingham. Dist. of Fulham, London. Hurlingham House, Putney Bridge, became in 1874 the h.q. of the Hurlingham Club, formed in 1867 for pigeon-shooting, a sport discontinued there in 1906. The club adopted polo in 1870, and became the governing body in England for that game. The polo ground was long a fashionable resort of the London season. The club resisted an L.C.C. proposal in 1946 to acquire the ground for a public park and housing site, and in 1948 it was agreed that only part of the ground should be so acquired, and then only as a park.

Hurn. Village of Hants, England, 6 m. N.N.E. of Bournemouth. In the Second Great War a large airfield was established here; this became the temporary commercial air terminal for London. From 1946 to 1950 Hurn was a maintenance base for B.O.A.C.; later the main diversion airport for London.

Huron. Name of a confederation of Indian tribes once living in Ontario. They were so called in derision by the French, the word

meaning lout. Of Iroquois race, their name for themselves was Wendat or islander, preserved under the form Wyandot. See American Indians; Wyandot.

Huron. Second in size of the great lakes of the St. Lawrence system, forming part of the boundary of the U.S.A. and Canada. Its length is 247 m., breadth 101 m., average depth 700 ft., and area 23,010 sq. m. The peninsula forming Georgian Bay deeply indents the Ontario coast, while Saginaw Bay projects into Michigan. The Sault Ste. Marie ship-canal connects the lake by North Channel with Lake Superior; St. Clair river and lake and Detroit river with Lake Erie; and the strait of Mackinac with Lake Michigan. The Maitland and Saugeen rivers enter Huron on the E. Canadian side, and Georgian Bay receives the French, Severn, and Nottawasaga rivers, while on the U.S. side are the Saginaw, Au Sable, and Thunder Bay rivers. The largest island is Manitoulin. Ports on its shores include Bay City, on Saginaw Bay, and Goderich, Kincardine, Owen Sound, Parry Sound, and Sarnia, in Canada. Whitefish, salmon, and other fish abound.

Huron. City of South Dakota, U.S.A., and co. seat of Beadle co. On the James river, 119 m. E. of Pierre, in the midst of an agricultural area, it is served by the Chicago and Northwestern and Great Northern rlys. and an airport. It ships cattle, sheep, hogs, dairy products, maize, potatoes, and alfalfa, and has rly. shops and offices, meat-packing and food-processing plants, breweries and bottling works. Huron College is here; and the state fair is held annually. Settled in 1880, it became a city in 1883. Pop. 11,146.

Huronian. Name of a group of rocks in the Pre-Cambrian system of Canada, found on the N. shore of L. Huron. They are typically sedimentary in origin, and are made up of sandstones, limestones, etc., or their metamorphosed equivalents. Of importance in them is the Gowganda conglomerate, which is believed by many to be an ancient deposit of boulder clay (*q.v.*) or tillite, indicative of a very early Ice Age. Masses of iron ore in the Huronian deposits S. of L. Superior supply the greater part of the iron industry of the U.S.A. Other economic minerals found in these rocks include gold, silver, lead, copper, and nickel.

Hurricane. Name given to the violent revolving storms experienced in the W. Indies and the

Gulf of Mexico. They originate over the hottest parts of the ocean in the regions where the dying trade winds merge into the equatorial calms. Moving along more or less precise tracks towards the temperate zone, they are most frequent in late summer or autumn. The winds round the whirls give mean velocities exceeding 75 m.p.h. and gusts of 100 m.p.h. or more. Sometimes these storms cross the U.S. from Texas to the Great Lakes; the accompanying huge waves cause great damage on the coasts and severe flooding inland, adding to the destruction wrought by the wind.

The storms off the coasts of Queensland are also termed hurricanes, but in the N. Pacific storms are generally referred to as typhoons, and in southern latitudes as cyclones. In the British Isles hurricane winds are occasionally encountered. *See Cyclone; Gale; Typhoon. Consult also Hurricanes: Their Nature and History, I. R. Tannehill, 1938.*

Hurricane. British fighter aircraft. Designed by S. Camm of the Hawker Aircraft company, it was the first standard monoplane fighter with enclosed cockpit, landing flaps, and retractable undercarriage. It had a wing span of 40 ft., a length of 32 ft., and was powered by a Rolls-Royce Merlin liquid-cooled engine giving a maximum speed of 305 m.p.h. Put into service with the R.A.F. in 1937, it formed the bulk of British fighter strength at the outbreak of war and during the battle of Britain (*q.v.*). It was also used in all overseas theatres of operations, by the Fleet Air Arm, and on merchant ships. The Hurricane was armed at first with eight Vickers machine-guns, later with four 20-mm. Hispano cannon. Certain Hurricanes were armed with two 40-mm. guns for anti-tank work. A version known as the Hurricane bomber carried up to 1,000 lb. of bombs. *See Aeroplane illus. p. 129; Catapult illus.*

Hursley. Parish and village of Hampshire. It is 5 m. S.W. of Winchester, and is noted for associations with Richard Cromwell and John Keble. At Hursley House Cromwell resided after his brief term of office, and the church

of All Saints, restored in the 19th century, contains a memorial to him. From 1836 to 1866 Keble was vicar here, and he is buried in the churchyard. The house, which was the property of Cromwell's father-in-law, was rebuilt after 1880 and, known as Hursley Park, was long the seat of the Heathcote family.

Hurst. An Anglo-Saxon word meaning a wood or copse. It is also used for a sand-block in the sea or a river. It is very common in English place-names. There are several which are simply Hurst, while to others, *e.g.* Wadhurst and Hurstpierpoint, the hurst is affixed or prefixed.

Hurst Castle. A fortress in Hampshire. It stands on a narrow promontory, 3½ m. from Lympington, at the W. end of the Solent. It was built by Henry VIII to guard the strait, and was for a time, in 1648, the prison of Charles I. It is now in the possession of the Admiralty.

Hurstmonceaux OR HERSTMONCEAUX. Village of Sussex, England. It lies 8 m. N.E. of Eastbourne. It takes its name from Waleran de Monceaux, lord of the manor in the 11th cent. It has a fine early 16th cent. church and is well known for its "trugs" or wooden garden-baskets. Hurstmonceaux castle is ½ m. N.E. It was

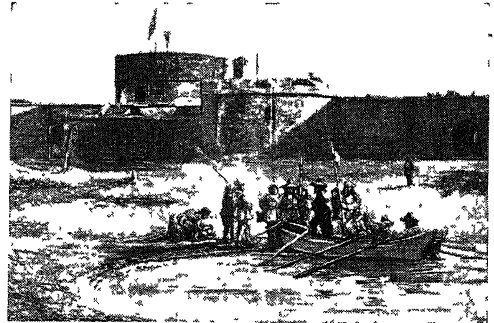
built, 1446, by Sir Roger de Fienes, treasurer of the household of Henry VI. The interior was pulled down, 1777, but the outer walls, the main gate house, and towers have remained intact. The castle, later restored, was in 1946 taken over by the Admiralty as h.q. of Greenwich Observatory

(*q.v.*). The solar and chronometer depts. and the nautical almanac office were installed by 1950; the move was to be completed by 1953.

Hurst Park. Racecourse in Surrey, England. It occupies a flat area of ground known as Molesey Hurst, abutting on the Thames, opposite Hampton.

Hurstpierpoint. Parish and village of Sussex, England. It lies at the foot of the South Downs, 8 m. N. of Brighton. Wolstenbury (677 ft.) is the nearest height. The village is connected by half-hourly bus service with Hassocks railway station, 1½ m. away. S. John's college, one of the Woodard Schools (*q.v.*), is in the vicinity. Pop. 3,900.

Hurtado de Mendoza, DREGO (1503-75). Spanish author and diplomatist. The famous Lazarillo de Tórmes is attributed to him, and was translated into English by David Rowland, but the ascription is doubtful. Mendoza was in England in 1537, when he made an attempt to bring about a marriage between Henry VIII and the infanta of Portugal.



Hurst Castle, Hampshire, built by Henry VIII for the defence of the Solent, and later the prison of Charles I
From an old engraving



Hurstmonceaux, Sussex. Main gate house and entrance to the castle
Frith

Hurter and Driffield. A chemist and an engineer respectively who in 1876, after studying the problems of photographic exposure, devised a method for the determination of relative emulsion speeds, thus laying the foundation of the science of sensitometry (*q.v.*). The letters H. & D. followed by a number on a packet of sensitised material indicate its comparative speed. *Consult The Photographic Researches of Ferdinand Hurter & Vero C. Driffield, ed. W. B. Ferguson, 1920.*

Hus OR HUSS, JOHN (c. 1373-1415). Bohemian theologian and reformer. Born of peasant stock at Husenitz, in S. Bohemia, he was educated at local schools until, about 1390, he went to the university of Prague. There he graduated and remained for some years. He was ordained priest in 1400, and put in charge of the Bethlehem chapel there. In 1402 he was appointed rector of Prague university, where he had been teaching philosophy. Deeply influenced by the writings of John Wycliffe (*q.v.*), his sermons and

writings showed that he was a formidable, though not extreme, critic of the Church's doctrine and discipline. At the same time Hus stood out as a strong champion of Czech rights against the Germans, who then exercised the chief control over the university, and



John Hus,
Bohemian reformer

in 1409 Wenceslas, king of Bohemia, altered its constitution so that Czech control was secured by a change in the voting power of the "nations" forming the university. This victory increased orthodox ecclesiastical feeling against Hus.

Hus Condemned as a Heretic

After this success an inquiry was ordered into allegations of heresy in his preaching, notably his avowed admiration for Wycliffe. In 1410, with the authority of a bull of Pope Alexander V, the archbishop of Prague, Sbinco, ordered the works of Wycliffe to be burnt, and in the next year Hus and his supporters, who included the great majority of the people of Prague, were laid under interdict by Pope John XXIII. Hus stood firm, but his repeated attacks on the principle of papal indulgences brought ultimately a break with the king and the university. In 1412 he left Prague, there being by now a sentence of excommunication on all who should harbour him, and retired to the country districts, where he preached and wrote various theological works, the most noteworthy being his *De Ecclesia*, a survey of doctrine on the basis of Wycliffe's writings.

The affairs of Bohemia had so disturbed the unity of the church that the emperor Sigismund offered Hus a safe-conduct to attend the council of Constance (*q.v.*), 1414, but on his arrival there the heretic was arrested. Tried before the council, the main charges being founded on excerpts from his *De Ecclesia*, he was condemned, his writings were burnt, and he died at the stake on July 6, 1415. A victim of both nationalist and ecclesiastical jealousies, he died with great bravery, and is generally ranked as a forerunner of the Protestant reformers. His death, however, far from ending the troubles of his country, provoked the wars of the Hussites (*q.v.*). See Bohemia; Protestantism.

Bibliography. The Age of Hus, H. B. Workman, 1902; Life and

Times of Master J. Hus, F. H. Lutzov, 1909; Pope John XXIII, and Master J. Hus of Bohemia, E. J. Kitts, 1910; Hus and His Followers, J. Herben, 1926; Warrior of God, P. Roubiczek and J. Palmer, 1947.

Husband and Wife. By the common law of England a married woman had no separate legal entity apart from her husband. Since the Law Reform (Married Women and Tortfeasors) Act, 1935, it is no longer legal for a wife to hold property as her "separate property" with the restrictions that attached to property so held. Restraint on anticipation was with a few exceptions abolished by the same Act. A married woman can acquire, hold, and dispose of property in all respects as if she were unmarried. Prior to the Married Women's Property Acts, 1870, 1874, 1882, a man could dispose as he liked, *jure mariti*, of all his wife's personalty such as money or shares, and he had control of the life interest in his wife's realty, *i.e.* land or freehold houses. This freedom of control was qualified by the court of chancery's recognition of trusts in favour of married women, whence grew the system of marriage settlements.

Under such a trust a wife could convey land without her husband's sanction and could bequeath it where she liked by will, but she could be restrained from anticipation by the grantor of the settlement during her married life; in this event she could not borrow money on the security of future rents. This restraint clause was invented by Lord Chancellor Thurlow to protect a wife's separate property from the machinations of her husband. The wife, however, could under the common law neither sue nor be sued alone in respect of such estate. Except in the cases of the wife of the king of England or of an outlaw, a wife could not sue or be sued as a *feme sole* or single woman could under the common law.

Married Women's Property Acts

In England the Married Women's Property Acts, 1870 and 1874, specified various forms of property as the separate estate of a married woman and gave her the same rights in regard thereto as a *feme sole* or single woman, and also affected a wife's contractual rights. These Acts were repealed by that of 1882, which affected all women married since Dec. 31, 1882, and all wives acquiring property since that date. By this a wife was entirely free to dispose of her own property, and to the extent of her

separate estate could make contracts and be liable for them, and might sue or be sued alone on them.

At common law a husband was liable for all debts contracted by his wife before her marriage. By the Act of 1882 the husband's liability for such debts was limited to the amount of any property which he might acquire in her right; by the Act of 1935 this liability for ante-nuptial debts was extinguished. That Act also put an end to his liability for torts—*e.g.* slander—committed by his wife during the marriage.

As to a wife's debts generally, a man who supplies his wife with necessaries suitable to her station in life is not liable for debts contracted by her without his previous authority or subsequent sanction, but without the latter a wife has no authority to pledge her husband's credit for household necessities. If there has been an account for some time with a tradesman the husband should notify him that he will not hold himself liable for his wife's debts; a public announcement by newspaper advertisement is a course often taken. If a man regularly allows his wife to run up bills in his name, she acts as his agent and he is liable to be called to pay them.

Separated Husband's Liabilities

While living apart from her husband a wife has an implied authority to bind him by her contracts for necessaries unless she is supplied with means to provide them herself. This applies if he has deserted her without cause, or has driven her away by cruelty or misconduct, but not if she has left him without good cause or has committed adultery. In judicial separation a wife has no implied authority if alimony is being paid; if not she becomes an "agent of necessity" of her husband, who must pay her reasonable bills. A divorced woman is restored to the contractual position of a *feme sole*.

A wife may be sued alone for torts committed either before or after marriage.

On the death of a wife, if she has left no will, the husband is entitled from her estate to £1000 together with all her personal chattels—*e.g.* furniture. He receives a life interest on the whole of her estate over that amount if she leaves no descendants, or on half her estate if there are descendants. A wife has similar rights on the death of her husband intestate. Under the Inheritance (Family Provision) Act, 1938, when a husband (or wife) has died leaving

a will which does not make reasonable provision for the maintenance of the widow (or widower), the survivor may apply to the court for an order that provision should be made out of the deceased's estate. *See* Bigamy; Divorce; Marriage; Settlement; Will.

Huscarl. Scandinavian word meaning man of the household, used for the bodyguard of a king or noble. They first appeared in England attached to Canute, and are mentioned several times in the 11th century. Surrounded by his huscarls, Harold fought at Stamford Bridge and Hastings, and similar bodies were kept by powerful earls. The name disappeared after the Norman Conquest.

Husi. Town of Moldavia, Rumania. It is 42 m. S.E. of Jassy, and is the capital of Falcu district. It is 5 m. W. of the river Prut, and 40 m. S.W. of Kishinev (Chisinau) the capital of Moldavia S.S.R., with which it is connected by rail. It contains an old cathedral, and is the seat of a Greek Orthodox bishop. It is a centre for wine and tobacco. Pop. 15,953.

Huskisson, WILLIAM (1770-1830). British statesman. Born at Birch Moreton, Worcestershire,



W. Huskisson
After J. Graham

March 11, 1770, he was educated partly in Paris. There he mixed with the authors of the Revolution, becoming a member of one of their moderate societies. In 1793 he obtained a

position under the British government, and in 1796 he entered the house of commons. A follower of Pitt, he was secretary of the treasury 1804-6, and again 1807-9.

Although a Tory, Huskisson was more advanced in his views than most of his party, and this perhaps was the reason why he remained out of political office until 1823. He was not, however, silent or unimportant, and it was during these years that he won his reputation as an economist. In 1823 he was made president of the board of trade and its chief adviser on economic questions. He promoted the navigation laws, the introduction of a new sinking fund, and steps in the direction of free trade. In 1827 he became secretary of the colonies, but resigned owing to a difference of opinion with his chief, the duke of Wel-

lington in 1828. He was run down and killed at the opening of the Liverpool & Manchester Rly., Sept. 15, 1830.

Hussar. The name given to certain light cavalry formations whose chief duties were reconnaissance, scouting, and roving commissions. The original hussars were Hungarian cavalry raised by Matthias I in 1428. Their success led to the introduction of this type of cavalry into most European armies, together with the distinctive hussar uniform of busby, short-ribbed-jacket, and palisse, or hanging jacket, worn over the left shoulder. During the 18th and early 19th centuries, a number of British light dragoon regiments were converted to hussar units, of which there were ultimately twelve: 3rd, 4th, 7th, 8th, 10th, 11th, 13th, 14th, 15th, 18th, 19th, and 20th.

The first hussar battle honour was gained at Dettingen in 1743 by the 3rd King's Own, since when hussar regiments have distinguished themselves in all major campaigns of the British army. The 4th formed part of the Light Brigade at Balaclava. The terrain of the S. African war was particularly suited to light cavalry, and the hussars had their full share of action.

At the outbreak of the First Great War, hussar regiments served as cavalry, distinguishing themselves at Mons and the first battle of the Marne. With the development of trench warfare, most hussar units fought as infantry; the 4th, 10th, and 18th took part in the dismounted cavalry charge at the second battle of Ypres, May 13, 1915. The 7th and 13th Hussars took part in the Mesopotamia campaign, serving in their traditional cavalry rôle.

Following the reduction of the cavalry establishment of the British army in 1922, the number of hussar regiments was reduced to nine by amalgamating the 13th with the 18th, the 14th with the 20th, and the 15th with the 19th. In 1928, the 11th Hussars was converted into an armoured car unit, and by 1937 all hussar regiments had been similarly mechanised. Throughout the Second Great War, hussars served with the Royal Armoured Corps (*q.v.*) as reconnaissance armoured car formations. *See* Army colour plate; Busby; Cavalry.

Hussein (629-680). Grandson of Mahomet. Son of the prophet's daughter Fatima, he took the part of his brother Hasan, who had

been ejected from the caliphate by Moawiya. On Hasan's death Hussein continued the struggle, but was finally routed and slain at Kerbela, Oct. 10, 680. The Shi'ites observe the day of his death as a day of mourning. *See* Hasan.

Hussein, IBN ALI (1856-1931). Arab ruler. Son of Mohammed, who became emir of Mecca in 1827, he was born at Mecca in 1856.

In 1870 he married the daughter of a subsequent emir and grand sherif of Mecca, Abdulla. Later he fell into disfavour with the Turks, being forced to live in Constantinople, but was finally himself appointed emir and grand sherif in 1908. He proclaimed in July, 1916, the independence of Arabia and the repudiation of Ottoman rule; then, organizing the Arab forces, and placing the northern army under the command of his son, the Emir Feisal (*q.v.*), he cooperated successfully with the Allies in the campaign against the Turks. His army captured Yambo, the port of Medina, in July, 1916; and before the end of the year he was formally recognized by the Allies as king of the Hejaz. As the result of the capture of Mecca by the Wahabis he abdicated, Oct., 1924. He was removed by the British to Cyprus, where he lived until 1930, when he went to Transjordan, where his son was emir. He died there, June 4, 1931.

Hussein Kamil (1853-1917). Sultan of Egypt. Born at Cairo, Dec. 20, 1853, the son of Ismail Pasha and a descendant of Mehemet Ali, Hussein finished his education in Paris, and, returning to Egypt, began to take part in the government of the country. After Ismail was deposed in 1879 he, with his father, lived for a few years in Italy, but returned after the fall of Arabi Pasha. Always a supporter of British rule, Hussein became president of the legislative council and general assembly in 1909, but held these posts for little more than a year.

In 1914, when Egypt was declared a British protectorate, Hussein became its first sultan, reigning from Dec., 1914, until his death on Oct. 9, 1917. He left one son, Hussein Kamil-ed-Din, commander-in-chief of the Egyptian army, but his successor was his brother, Ahmed Fuad. *See* Egypt.



Ibn Ali Hussein,
Arab ruler

Husseini, HAJ MOHAMMED EMIN EL (b.1895). Arab religious leader and politician, self-styled "grand mufti."



El Husseini, the "Grand Mufti"

Born at Jerusalem, he was educated in Turkey and Egypt. His influential family and other Arab notables had him elected in 1921 as mufti

—adviser on and interpreter of Muslim canonical law—of Jerusalem. The title of grand mufti and his description as Seyid, descendant of the Prophet, was of his own creation.

The mufti inspired the anti-Zionist Arab disturbances of 1935-36, and when they failed to achieve their purpose fled to Lebanon; then to Bagdad, where he inspired the Rashid Ali dictatorship; to Teheran, where he lived in the German and Japanese legations until Persia was occupied by Allied forces; and, in 1941, to Berlin, where he was received by Hitler and Ribbentrop. On the Nazi collapse he was captured by French forces and lived near Paris under police surveillance until in 1946 he made his escape by air to Egypt. A new mufti was nominated in his place, Dec. 20, 1948.

Hussites. The followers of John Hus (*q.v.*). After the burning of their leader at Constance in 1415 these Bohemians, and others who accepted his teaching, formed themselves into a league, which became so powerful that Wenceslaus, king of Bohemia, was forced to tolerate them. On his death, 1419, the crown of Bohemia passed to his brother, the emperor Sigismund, who was particularly obnoxious to the Hussites, because it was under his safe-conduct that Hus had gone to Constance. War broke out in 1420 between the emperor and the Hussites, and the opposition of the latter was immensely strengthened by the prevalent Slav feeling against Teutonic encroachments.

Pope Martin V supported the emperor in his struggle, but for eight years no headway was made against the able generals of the Hussites, Ziska and Prokop. Eventually, in 1431, the council of Basel undertook to arrange peace between the emperor and the more moderate Hussites, known as the Calixtines; a formal agreement was ultimately signed in 1436. Meanwhile, the more fanatical Hussites, known as the Taborites, had stood out against compromise,

but they were defeated in 1434. See Bohemia; Protestantism; Reformation; Sigismund.

Hustings (Scand. *hus*, house; *thing*, meeting). Platform or elevated stand on which candidates for membership of the British house of commons used to be nominated, and from which they addressed their constituents. The ceremony of nomination was generally made the occasion of an outbreak of horseplay on the part of



Hustings. A satirical picture by Hogarth showing a scene on the hustings during polling

the audience. After the nomination of candidates, the electors came up on to the hustings, gave their names, and declared for whom they voted, which declaration was recorded. Elections so conducted sometimes went on for several days. Nomination on the hustings was abolished in 1872.

The term was also used for the courts of hustings, which formerly existed in many cities for dealing with actions for the recovery of land within the city limits. The court of hustings of the city of London formerly had probate jurisdiction, and wills were registered there, but all such privileges are now obsolete.

Hutcheson, FRANCIS (1694-1746). British philosopher. Born in Ireland, Aug. 8, 1694, he became in 1729 professor of moral philosophy at Glasgow, where he had already studied, 1710-1716. The remainder of his life was spent in his duties there.



Francis Hutcheson, British philosopher

He is generally considered the founder of the Scottish school of philosophy. Man possesses a moral sense of what is right or wrong, which directly approves or disapproves of any course of action. Moral goodness consists in a proper

relation of man's various inclinations founded on the above moral sense. General benevolence and disinterestedness, the endeavour to secure general happiness, constitute virtue. Man also possesses a sense of the beautiful, which judges beauty as the physical taste judges flavour. See Francis Hutcheson. W. R. Scott, 1900.

Hutchinson. A city of Kansas, U.S.A., the co. seat of Reno co. It stands on the Arkansas river, 60 m.

N.W. of Wichita, at an altitude of 1,553 ft. and is served by several rlys. In the centre of a wheat-producing belt, it has flour mills, meat-packing plants, and oil refineries, and ships flour, live-stock, dairy products and lumber. The production and shipment of salt from local salt beds is an important industry. The state industrial reformatory is here. Hutchinson dates from 1871, and became a city in 1872. Pop. 30,013.

Hutchinson, ARTHUR STUART MENTETH (b. 1879). British novelist. Born in India, June 2, 1879, he gave up a medical career for journalism, devoting himself to novel writing after he achieved popularity with his fourth book, *If Winter Comes*, 1921. Among his other works are *This Freedom*, 1922; *One Increasing Purpose*, 1925; *Big Business*, 1932; *As Once You Were*, 1938; *It Happened Like This*, 1942.

Hutchinson, JOHN (1615-64). English soldier. Son of Sir Thomas Hutchinson, of Owthorpe, Nottinghamshire, his



Col. J. Hutchinson, English soldier

mother being a Byron, he was born in Sept., 1615. Educated at Nottingham, Lincoln, and Peterhouse, Cambridge, he became a lawyer. When the Civil War broke out he took up arms for parliament, and, on account of his local standing, was made governor of Nottingham castle, which he defended until the end of the war. He sat as M.P. for Nottingham, was one of the king's judges, signing the death warrant, and afterwards a member of the council of state. Disagreement with Cromwell soon drove him into retire-

ment, from which he emerged in 1659 to sit in the restored parliament and support Monk. He sat also in the convention of 1660, but was expelled therefrom. In 1663 he was arrested on a charge of being concerned in a plot against the king, and he was still in prison when he died at Sandown, Kent, Sept. 11, 1664. Colonel Hutchinson married Lucy (1620–c. 1680), daughter of Sir Allen Apsley, lieutenant of the tower of London, where she was born, Jan. 29, 1620. She wrote the *Memoirs of her husband*, which give a delightful picture of the man, first published in 1806; a good edition was edited by C. H. Firth, 1885.

Hutchinson, Sir Jonathan (1828–1913). British surgeon. Born at Selby, Yorkshire, July 23, 1828,



Sir J. Hutchinson,
British surgeon
Elliott & Fry

he was trained at S. Bartholomew's Hospital. He was Hunterian professor at the royal college of surgeons, and its president in 1889 and 1890.

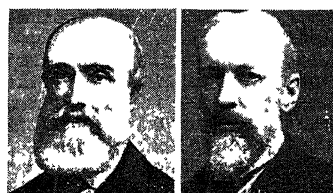
He was a member of the royal commission on small-pox hospitals, 1884, and on vaccination, 1890–96, founder of the London post-graduate school of medicine, and honorary secretary of the Sydenham Society. For nine years he edited *Archives of Surgery*, and wrote and lectured much on gout, neuropathogenesis, leprosy, and syphilis, being recognized as the first authority on these last two diseases. He founded and superintended educational museums at Selby and at Haslemere, where he made his home. Hutchinson was knighted in 1908, and died June 23, 1913. Consult *Jonathan Hutchinson*; *Life and Letters*, H. Hutchinson, 1946.

Hutchinson, Graham Seton (1890–1946). British soldier and author. Born at Hampstead, London, June 20, 1890, he was educated at Bradford and Woolwich. He had a distinguished record in the First World War, becoming lieutenant-col. Invited by the war office to select officers for the Upper Silesia Plebiscite Commission, he himself went out as secretary and A.D.C. to Col. H. Percival, British commissioner. He became first principal of the Shri Shivaji military school at Poona, 1932. Under his full name, he published an autobiography, *Footslogger*; *Machine Guns*, their *History and Employment*, and

other books; while under the name Graham Seton he wrote a number of successful works of fiction, notably *The W Plan* (published 1929, afterwards filmed), *The Viper of Luxor*, *The Governor of Kattawitz*, and *The Secret Circle*. He died at High Wycombe April 3, 1946.

Hut Circle. Remains of a prehistoric dwelling of the round-hut type. The best British examples are in Anglesey, Cornwall, Dartmoor, and Northumberland. They are often associated with Neolithic stone monuments, and were used also during the Bronze age and the early Iron age. At Ty Mawr, Holyhead, was a village of 50 huts, one with slab partitions. At Carn Brea, Cornwall, a hundred granite circles were traced. On Dartmoor they are of upright slabs, doubtless once thatched with heather or turf on pole rafters. The hut circle may be an earthen mound round a pit-dwelling as at Hayes Common, Kent, sometimes stone-lined as at Hurstbourne, Hants. See *Dwelling*.

Huth, Alfred Henry (1850–1910). British bibliophile. Born in London, Jan. 14, 1850, he was the second son of Henry Huth (1815–1878), and a grandson of Frederick Huth, a Hanoverian who settled in England in 1809, became



Henry Huth, Alfred H. Huth,
British bibliophiles

naturalised, and founded the banking firm of Frederick Huth & Co. Henry Huth, bibliophile and banker, was an intimate friend of the historian H. T. Buckle (*q.v.*) who helped him in the formation, at a cost of some £120,000, of his extensive library of rare MSS. and prints, and early printed books in English, Spanish, and German. Alfred Henry Huth, had all his father's love of books. Educated at Rugby and Berlin, he travelled as a youth in the East with Buckle as his tutor. He inherited his father's library, which he augmented. Part founder and vice-president of the bibliographical society, vice-president of the Roxburghe club, he published *Marriage of Near Kin*, 1875; *Life and Writings of Henry Thomas Buckle*, 1880; *Goethe's Faustus in English*

verse, 1889, and other books. He died Oct. 10, 1910.

His will gave the trustees of the British museum the choice of 50 items from his library; they selected 13 MSS. and 37 printed books. Alexander Cochrane purchased for some £50,000, and presented to the Elizabethan club, Yale, copies of the four Shakespeare folios and 39 rare Shakespeare quartos. The remainder of the Huth library was sold publicly, Nov., 1911–June, 1920, and realized a total of £278,498.

Hutten, Philip von (c. 1500–46). A German adventurer. He was a member of a party who went to Venezuela under George of Speyer in 1535. Their object was to conquer the land, and on George's death, 1540, Hutten became commander. The following year he led a party of men to find El Dorado, and after a vain search his broken party returned in 1546 to Venezuela, where they were entrapped by Juan de Carvajalos, who had usurped the governorship, and Hutten was treacherously put to death.

Hutten, Ulrich von (1488–1523). German poet and satirist. He was born April 21, 1488, at the castle of Steckelberg, near Fulda. Though the eldest son of a noble family, he seemed so sickly that at the age of 11 he was sent to the Benedictine monastery of Fulda. He fled from there in 1505, quarrelled with his father, and led a wandering scholar's life.

He early attacked papal pretensions in mordant Latin epigrams, contributed to the *Epistolae Obscurorum Virorum*, and wholeheartedly joined in the Lutheran Reformation. He had been crowned poet laureate by the emperor Maximilian in 1517. Driven into exile, he died in his prime on the island of Ufnau, in the lake of Zürich, Aug. 28, 1523. His complete works, *Opera Omnia*, in 7 vols., edited by E. Böcking, were published 1859–62. See *Reformation*; *Renaissance*; consult also *Ulrich von Hutten*, F. Strauss, 1858–60 (Eng. trans. 1874); *Ulrich von Hutten*, Knight of the Order of Poets, D. S. Jordan, 1910.

Hutton, James (1726–97). British geologist. He was born at Edinburgh, June 3, 1726, and, although intended for the law, studied medicine, graduating at Leyden, 1749. Again changing his plans, he took to farming, and at the same time turned his attention to geology. After a visit to the Continent, he settled in Berwickshire in 1754, moving in 1768 to

Edinburgh, where he associated with Joseph Black and other scientists. The results of his



James Hutton,
British geologist
After Raeburn

studies were embodied in his *Theory of the Earth*, 1785. In this work he explained the condition of the crust of the earth as being the result of conditions still operating. Investigations of the *Principles of Knowledge*, 1794, was his last published work, although he was engaged on *The Elements of Agriculture* when he died, March 26, 1797.

Hutton, LEONARD (b. 1916). English cricketer. Born at Pudsey, Yorks, June 23, 1916, he was tried for Yorkshire in 1934 and played an innings of 196 at Worcester. Protégé of Herbert Sutcliffe (*q.v.*), who publicly prophesied a great future for him, he showed extraordinary powers of concentration and defence, as well as driving stylishly. In 1937 he scored 2,888 runs, with an average of 56.62. Opening England's innings against Australia at the Oval on Aug. 20–23, 1938, he broke the world record for a test match by score and length of innings, 364 in 13 hours 20 mins. He was England's opening batsman in S. Africa in 1938–39, in Australia in 1946–47, at home against S. Africa in 1947 and in four tests against Australia in 1948, and again in S. Africa, 1948–49. At Johannesburg, Dec. 27, 1948, he shared with C. Washbrook in a world record test match first-wicket partnership of 359 runs. He had the highest English batting aggregate in 1939, 1948, and 1949. His total of 3,429 runs in 1949 was not only a record aggregate for a Yorkshireman but included the record number of runs scored in one month, 1,294 in June; the latter feat was the more remarkable in that it included three successive scores of 0. Hutton's autobiography, *Crickets My Life*, appeared in 1949.

Hutton, RICHARD HOLT (1826–97). British journalist and theologian. Born at Leeds June 2, 1826, he was educated at University School and College, London, and

Heidelberg and Berlin. Influenced theologically by F. W. Robertson and F. D. Maurice, he abandoned Unitarianism for Anglicanism. He edited *The Inquirer*, 1851–53; was joint editor with Walter Bagehot of the quarterly *National Review*, 1855–64; assistant editor of *The Economist*, 1858–60; and, with Meredith Townsend, joint editor and part proprietor of *The Spectator*, 1861–97. Principal of University Hall, London, while he was editing *The Inquirer*, he was professor of mathematics at Bedford College, 1856–65. He died Sept. 9, 1897.

Hutton did much to popularise the philosophy of Walter Bagehot and the poetry of Matthew Arnold and William Watson. Under his direction *The Spectator* became the most influential periodical of its kind in England. His writings include *Incarnation and Principles of Evidence*, 1862; *Bagehot's Literary, Economic, and Biographical Studies*, 1879–81; *Criticisms on Contemporary Thought and Thinkers*, 1894.

Huxley, ALDOUS (LEONARD) (b. 1894). British author. Third son of Leonard Huxley (1880–1933, man of letters and sometime editor of *The Cornhill Magazine*) and grandson of Thomas Henry Huxley (*v.i.*), he was born July 26, 1894, and educated at Eton and Balliol College, Oxford. His third book, *Limbo*, 1920, a collection of short stories, attracted attention. In the same year he published *Leda*, poems, and this was followed in 1921 by *Crome Yellow*, the first of a series of striking novels, essays, books of travel, poems, etc. With a somewhat bitter wit he combined a philosophical outlook tending increasingly towards mysticism, especially after he settled in the U.S.A. Others of his books were *Antic Hay*, 1923; *Little Mexican*, 1924; *Those Barren Leaves*, 1925; *Jesting Pilate*, 1926; *Point Counter Point*, 1928; *Brave New World*, 1932; *Eyeless in Gaza*, 1936; *Ends and Means*, 1937; *After Many a Summer*, 1939; *The Perennial Philosophy*, 1946; *Science, Liberty, and Peace*, 1947; *Ape and Essence*, a satire, 1949; *Themes and Variations*, essays, 1950. *Grey Eminence*, 1941, was a profound study of religion and politics in the life of Richelieu's

agent, Father Joseph. A play, *The World of Light*, dealing with spiritualism, was produced in 1931. He also dramatised an early short story, *The Gioconda Smile*, produced 1948. *The Art of Seeing*, 1943, described how his eyesight, poor from childhood, was improved by treatment.

Huxley, JULIAN SORELL (b. 1887). British biologist and writer. Eldest son of Leonard Huxley and grandson of Thomas Huxley (*v.i.*), he was born June 22, 1887, and educated at Eton and Balliol College, Oxford, where he won the Newdigate prize, 1908, and took a



Julian Huxley,
British biologist

first in natural science, 1909. After holding academic posts in England and the U.S.A., in 1919 he became senior demonstrator in zoology at Oxford. Fullerian professor of physiology at the Royal Institution, 1926–29, and honorary lecturer at King's College, London, 1927–35, he was secretary to the Zoological society of London, 1934–42. He was made F.R.S. 1938.

To his technical brilliance he added a gift for popular presentation, and was in demand as a broadcaster; he was a member of the original B.B.C. "brains trust." During 1946–48 he acted as first director-general of the United Nations' educational, scientific, and cultural organization (Unesco). Besides technical papers, he published *Essays of a Biologist*, 1923; *The Stream of Life*, 1926; *Religion Without Revelation*, 1927; *Bird-watching and Bird Behaviour*, 1930; *Africa View*, 1931; *At the Zoo*, 1936; *The Living Thoughts of Darwin*, 1939; *The Uniqueness of Man*, 1941; *On Living in a Revolution*, 1944; *Man in the Modern World*, 1947; *Soviet Genetics and World Science*, 1949, and many other books.

Huxley, THOMAS HENRY (1825–95). British biologist and scientist. Born at Ealing, May 4, 1825, he was apprenticed to a doctor, subsequently obtaining a free scholarship at Charing Cross Hospital. Shortly after qualifying with honours, he received the appointment of assistant-surgeon on H.M.S. *Rattlesnake*, then about to start on a surveying expedition in the Torres Straits. The three years' voyage of the *Rattlesnake*



Aldous Huxley,
British author

gave Huxley the opportunity of indulging to the full his fondness for zoology, and the results of his observations were embodied in a paper *On the Anatomy and Affinities of the Family of the Medusae*, 1849, which marked a new epoch in comparative anatomy. In 1851 he was elected F.R.S., and granted the medal of the Royal Society in 1852. In 1854 Huxley received an appointment at the School of Mines, which he held for most of the remainder



Thomas Huxley

of his life. During 1852-55 he published a number of technical papers, including the important one *On the Morphology of the Cephalous Mollusca*, which placed him in the front rank of biologists.

The great work, however, of Huxley's life was as the exponent of the doctrine of evolution, first formulated by Darwin in 1859. The new doctrine aroused the bitterest opposition, and Huxley found it a most congenial task to vindicate a theory after which he himself had been groping in his own scientific researches. His lectures to working-class audiences *On the Comparative Anatomy of Man and the Higher Apes* (published 1863 as *Zoological Evidence as to Man's Place in Nature*), delivered during 1859-62, and *On the Causes of Phenomena of Organic Nature*, widened his sphere of influence. His essays and addresses of the next ten years were fruitful in criticism, and had a lasting influence upon scientific progress and freedom of thought.

During 1862-84 Huxley was a member of ten royal commissions, took part in the work of scientific societies, and wrote many highly

technical papers, in addition to his books and essays. He was one of the first members of the London School Board, 1870, secretary of the Royal Society, 1871-81, and its president, 1881-85, receiving the Copley medal in 1888 and the Darwin medal in 1894. The only honour he would accept was a privy councillorship, 1892. His unremitting labours led to the breakdown of a constitution that had never been strong, and in 1885 he retired to Eastbourne, where he died June 29, 1895.

Honoured by innumerable British and foreign societies, Huxley was one of the outstanding men of science of the 19th century. His remarkable powers of research, his clear exposition of scientific facts, and his accuracy of deduction have rarely been equalled. He not only left his permanent mark upon scientific progress, but laid down many of the foundations of later political, social, and moral reforms.

Huxley's eldest son Leonard (1860-1933), who became editor of the *Cornhill Magazine*, wrote a life of his father, 1900. *Consult* also lives by P. Chalmers Mitchell, 1900; E. Clodd, 1902; J. R. Ainsworth Davis, 1907; E. W. MacBride, 1935.

Aldous and Julian Huxley, two sons of Leonard by his first marriage, are noticed separately.

Huy. Town of Belgium, in the prov. of Liège. It lies on the Meuse, 18 m. by rly. S.W. of Liège. Paper-making and breweries are the chief industries, and in the neighbourhood are the only vineyards in Belgium, also coal mines, iron-works, etc. The dominating feature of the town is the terraced citadel, a fortress built in 1822. The church of Notre Dame, with a fine rose-window, was begun in 1311, and rebuilt in the later Gothic of the 16th century. In the ruined abbey of Neufmoustiers, to the E. of the town, Peter the Hermit, its founder, was buried.

Huygens, CHRISTIAAN (1629-95). Dutch physicist. Born at The Hague, April 14, 1629, he was the son of Constantijn Huygens (*vi.*). He studied at Leyden and Breda, winning a high reputation in mathematics and astronomy. In the latter science he made a number of improvements in tele-

scope lenses, discovering with their aid, in 1655, Saturn's first satellite, Titan, and the true nature of its ring. In 1660 he visited England, and to him Newton was indebted in developing his laws of motion. In 1678 Huygens announced his wave theory of light, by which he was able to explain reflection and refraction, but he failed to explain the polarisation of light, also discovered by him, by means of the theory. In 1673 was published *Horologium Oscillatorium*. It contained the earliest attempt to apply dynamics to bodies of finite size, and dealt also with pendulum clocks, to which Huygens was the first to apply the device. The first watch regulated by a spring balance was made under the direction of Huygens at Paris, and presented to Louis XIV. His numerous scientific works were collected and republished in ten vols., 1888-1905. Died June 8, 1695.

Huygens, SIR CONSTANTIJN (1596-1687). Dutch poet. Born at The Hague, Sept. 4, 1596, he studied at Leyden, London, and Oxford. He entered the state service and undertook diplomatic missions to Italy and London, 1621-23, being knighted by James I in 1622. In 1625 he became notary to the prince of Orange, a position he held for 50 years, and in 1630 a member of the privy council. Though not great as a poet in creative ideas, he was unrivalled in mastery of form and language, and as a statesman and writer stands out a lofty figure in Holland's great day. He was a life-long admirer and friend of John Donne. His collected poems, *Korenbloemen*, appeared in 1658, and *Trijntje Cornelis*, a drama, in 1659. He died March 28, 1687.

Huysmans, CAMILLE (b. 1871). A Belgian statesman. Born at Bilsen, Limbourg, May 26, 1871, he was educated at Liège. He became professor of philology at Ypres and later at Brussels. He entered parliament as a Socialist deputy in 1910. Appointed secretary of the international socialist bureau, 1905, he became secretary of the second international, 1914, and took a leading part in organizing its 10th international congress at Geneva, 1920. In 1925 he was minister of science and arts, in 1926 of education. Huysmans was chosen president of the chamber of deputies in 1936. He was mayor of Antwerp at the beginning of the Second Great War, and accompanied the

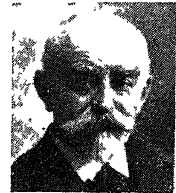


Christiaan Huygens
Dutch scientist

Belgian Government to London after the surrender of the Belgian army. He was reinstated as mayor of Antwerp in Sept., 1944, appointed minister of state, 1945, and was prime minister, 1946-47. His published works include *Study in Social Insurance*, 1912; *Four Types*, 1937; *Letters to a Young Socialist*, 1945.

Huysmans, Joris Karl (1848-1907). A French writer. Born in Paris, Feb. 5, 1848, of Dutch descent, Huysmans spent a great part of his life as a civil servant, but produced a number of books which mark him as one of the most interesting writers of his generation. His first phase was one of uncompromising realism, under a Goncourt-Zola influence, *Marthe*, 1876, and *Les Soeurs Vatard*, 1879, being the best of his early novels. He then turned to studies of extreme decadence, in *A Rebours*, 1884, and of Satanism, in *La Bas*, 1891, in which the chief figures, *Des Esseintes* and *Durtal* respectively, seek to satisfy their aspirations by curious refinements of bodily and spiritual sensation. With *En Route*, 1895, Huysmans entered his final stage, leading the *Durtal* of *La Bas* into a mystical Catholicism which was further developed in *La Cathédrale*, 1898, and *L'Oblat*, 1903.

Huysmans also wrote volumes of art criticism and the life of S. Lydwine of Schiedam, 1901. His style is marked by erudition in phraseology; some of his works have been translated into English. He died in Paris, May 13, 1907.



J. K. Huysmans,
French writer

Huysmans, Jan van (1682-1749). Dutch painter. Born at Amsterdam, he studied under his father, Justus van Huysum, and became a painter of flower and fruit pieces. Specimens of his work are in the National Gallery and the Louvre. He died Feb. 8, 1749.

Hvar. Yugoslav name of the Adriatic island called in Italian *Lesina* (q.v.).

Hven. Small island in The Sound, belonging to Sweden. It is 9 m. S. of Helsingborg, and was long the home of Tycho Brahe (q.v.). There are remains of his observatory on the island.

Hwai-an. A town of China, in Kiangsu prov. It stands on the Grand Canal and is an important salt-producing centre.

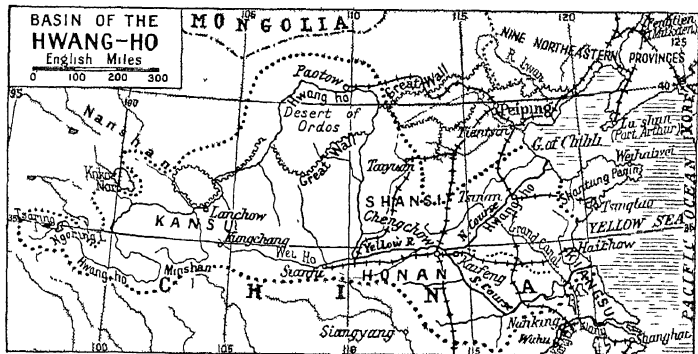
Hwai-ho. River of China. It rises in the S. of Honan prov., and after an easterly course of 450 m. flows into Lake Hungtseh in Anhwei. The river is liable to severe floods, which have often caused widespread devastation; and after the defeat of Japan in 1945 the Chinese government drew up plans for engineering works to control the river's waters.

Hwaining. Capital of Anhwei province, China, also known as Anking. On the Yang-tse-kiang, 364 m. W. of Shanghai, it is a port of call for steamers. Pop. 38,000.

Hwang-ho or **HOANG-HO** (Yellow river). One of the two great rivers of China. Rising at an elevation exceeding 2½ m. above sea level in the plateau of Tibet, it flows to the Pacific Ocean through the Nanshan and Minshan mountain ranges. Its strictly mountainous section terminates at Lan-chow in Kansu province, where the bed is less than 1 m. above sea level, and whence it flows N.E., then E., and then S. round the desert plateau of Ordos. Its chief right bank tributary, the Wei-ho, rises

of the river, with its great load of silt that gives it a yellow appearance, has been building up its bed for many centuries until it is considerably higher than the surrounding plain. Embankments have been built to restrain the waters, but there is always the chance that the catastrophe of 1887, when the river burst its banks and drowned a million people, will be repeated. During such times the waters may rise 40 ft. and send a 30-mile-wide flood, 20 or more ft. deep, over the plains.

The Hwang-ho delta extends from Kai-feng to the Gulf of Chih-li and to the Yellow Sea at the old mouth in Kiang-su province. When, in 1938, the Chinese broke the S. dyke in the hope of slowing the advance of the Japanese by flooding the country, the river changed its course again, roughly reverting to the old one into the Yellow Sea. Dyke reinforcement was completed in 1947, when the Central Govt. diverted the river back to its N. course as a military move against the Communists. Between the N. and S.



Hwang-ho. Map of the basin of the great Chinese river which flows through a course of 2,600 miles from the Tibetan plateau to the Pacific Ocean

near the meridian of Lan-chow, and flows E. to join the main stream at the end of the long S.-flowing stretch. Thus the two rivers almost surround a rectangle, 400 m. by 200 m., of which the northern half is one of the dreariest wastes in the world. From the Wei-ho confluence the course is E. to Kai-feng, on the great plain of N. China, and at the head of the great Hwang-ho delta.

The total course to the mouth in the Gulf of Chih-li is about 2,600 m. Above the Wei-ho confluence the river is of little practical importance, as the valley has a scanty population; in the desert reaches the river frequently changes its bed. The great plain is overlain by deposits of wind-born loess and alluvial mud from the Hwang-ho; the strong current

mouths the hills of the Shantung peninsula prevented a development of tidal mouths and numerous distributaries such as characterise the delta of the Ganges, but since records were first kept by the Chinese the main mouth of the river has shifted seven times in 4,300 years. Here the river is rightly named "China's sorrow," since its vagaries are an ever-present menace. These conditions make the river channels of little use for navigation. The river marks the W. and S. boundary of Shansi prov. and the N. boundary of Ho-nan. Below Lan-chow a stretch of the river is bordered by a section of the Great Wall of China.

Hyacinth or **JACINTH.** Gemstone. The name was originally applied to blue stones, including sapphire, but is now used for a host of

reddish-yellow gemstones including zircon, garnet, topaz, idocrase, and ferruginous quartz, and particularly for zircon.

Hyacinth. A hardy bulbous flowering plant of the family Liliaceae. Originally natives of Spain, Switzerland, Italy, and France, they were first introduced to Britain in 1596. Each bulb bears a spike of bell-shaped, sweetly scented flowers in all colours except a good yellow. Hyacinths are grown on a great scale in Holland, and are cultivated by planting in sandy soil during Sept. or Oct.

By choosing early and late varieties, it is possible to have hyacinths in bloom from Dec. until spring. The first to flower are the Roman and the miniature or cynthella hyacinths: if the bulbs are potted in sandy, loamy soil in August and are placed out of doors and covered with old ashes, they will be well rooted in six weeks and should then be brought into a warm greenhouse. If set in bowls of fibre or vases of water in Sept., kept dark until growth begins, and then placed in a room window, hyacinths will bloom in Feb.-March. Hyacinth bulbs are planted out of doors in Oct., 3 ins. deep and 9 ins. apart. The finest spikes of bloom are borne by new, freshly-planted bulbs. Old bulbs will continue to bear small spikes indefinitely.

The wild hyacinth or bluebell (*q.v.*) is *Scilla nutans*.

Hyacinthe, PÈRE (1827-1912). French Carmelite whose name was Charles Jean Marie Loyson. He



was born at Orléans, March 10, 1827, and entered the Carmelite order. He was the most notable preacher of his day in France, and attracted vast crowds to S. Sulpice and Notre Dame, Paris, denouncing abuses in the Church until in 1869 he was suspended on a charge of indiscipline. He obtained a dispensation from his vows, and for a while acted as a secular priest; but his refusal to submit to the decree of papal infallibility led to his separation from the Roman Church. He associated with the Old Catholics,

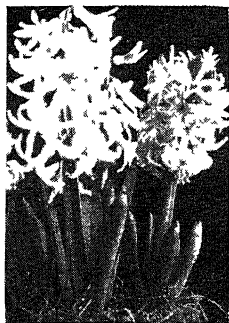
and married in London in 1872. For some time he served the Old Catholic Church at Geneva, and in 1879 he founded a Gallican Church at Paris. His later years were spent in travelling in the East. He died Feb. 8, 1912.

Hyacinthus (Gr. *Hyakinthos*). In Greek mythology, a beautiful youth beloved of Apollo. He was

accidentally killed when playing quoits with the god. From his blood sprang the flower of the same name, though it is doubtful whether the Greek flower was the hyacinth of today. Hyacinthus, like Adonis, represents the spring vegetation which withers away under the heat of the summer sun.

Hyades (Gr. *hýein*, to rain). In Greek mythology, nymphs who were entrusted by Zeus with the care of the infant Dionysus. They were afterwards placed among the stars as a cluster. The heliacal rising (*q.v.*) of this cluster coincided with the beginning of the rainy season. *Pron.* Hy-a-deez.

Hyæna. Family of carnivorous mammals (Hyaenidae). They are now confined to Asia and Africa, though they were common in England in the Stone Age. They are placed by zoologists near the civets. Hyænas are of ugly and repulsive appearance, with shaggy



Hyacinth. Flower spikes in full bloom



Hyæna. Spotted hyæna. Top. Indian striped hyæna W. S. Berridge, F.Z.S.

hair, broad heads, powerful jaws, sloping backs, and short tails. They are of morose and cowardly character, and live on carrion, though they have been known to attack children, rarely men, and to carry off sheep and calves in times of stress.

Three species are recognized, the striped, the spotted, and the brown hyæna.

Hyalite (Gr. *hyalos*, glass) or MULLER'S GLASS. A transparent, colourless variety of opal occurring as globular concretions, and crusts with a globular surface. It is less readily dissolved in caustic alkalis than other varieties of opal. *See* Opal.

Hybla. Name of several ancient towns of Sicily. Hybla Major, or Galeatis, on the S. slope of Mt. Etna, was originally a Sicel city, afterwards Hellenised. This is probably the Hybla famed for Hyblaean honey. Hybla Minor, afterwards known as Megara, is supposed to have stood on the coast near Syracuse. It was destroyed by Gelo of Syracuse in 481 B.C. Hybla Heraea was on the S. coast near Agrigentum (modern Agrigento or Girgenti).

Hybridisation (Lat. *hibrida*, mongrel). Term used loosely in common speech for the breeding together of two distinguishable groups of animals or plants, or for the deliberate mating of any two distinguishably different individuals with the intention of producing a hybrid. Many, but not all, hybrids are sterile, and so can be maintained as a race only by vegetative propagation, as by cuttings, or by constantly recruiting the population by fresh hybrid matings of different parents. Many varieties of apple are an example of the former, and mules are an example of the latter method of maintaining a population. In many cases, but not in all, the hybrid is found to be more vigorous than either of its parents, a fact of great practical importance, as for instance in breeding mules for use where neither donkeys nor horses would be of much service. *See* Biology.

Hydatid Disease (Gr. *hydatis*, watery vesicle). Formation of cysts due to infection by the embryos of a parasitic worm. The mature worm *Taenia echinococcus* is less than half an inch in length, and inhabits the intestine of the dog, jackal, and wolf. It consists of a head with four suckers and a double row of from 28 to 50 hooklets, and three or four segments. Man becomes infected either by fondling the infected dog, or

possibly consuming water or meat containing the ova. The embryo bores its way usually into the liver and there causes a cyst to grow. Pressure symptoms or the breaking down of the cyst into a suppurating mass are the commonest results. Removal by surgical operation is the best treatment, but opening and draining the cavity may effect a cure. The disease is rare in Britain, common in Australia and Iceland.

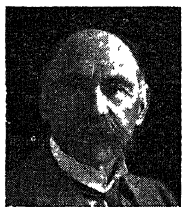
Hyde. Municipal borough and market town of Cheshire, England. It stands on the Tame, $7\frac{1}{2}$ m.



Hyde arms

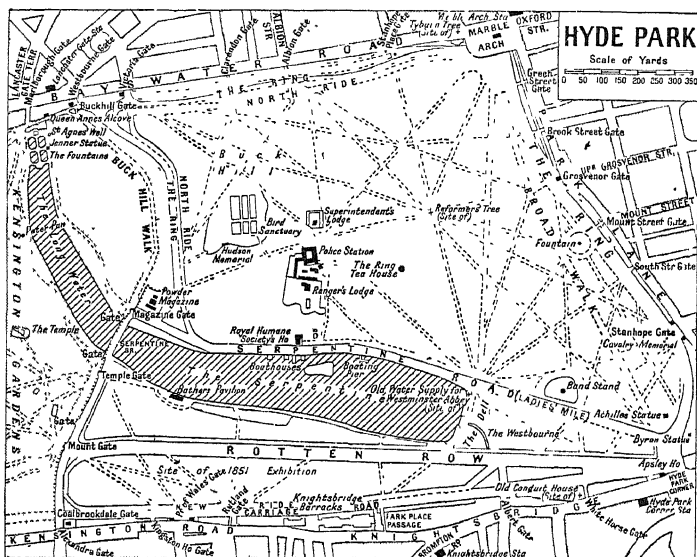
E.S.E. of Manchester, and is served by rly. Its chief industries are cotton mills and hat making, while it has iron foundries, engineering works, and glove works. The chief buildings are the public hall, municipal offices, public library, and technical school. Hyde was made a borough in 1881; Stalybridge and Hyde form a co. constituency. Market day, Sat. Pop. 31,030.

Hyde, DOUGLAS (1860-1949). Gaelic scholar, president of Eire, 1938-45, known as An Craoibhin Aibhinn (delightful little branch). A Protestant, born Jan. 17, 1860, he was educated at Trinity College, Dublin. President of the Gaelic League from its foundation, 1893, until 1915, in 1906 he presented to it £11,000 earned by lecturing in the U.S.A. He taught languages at the univ. of New Brunswick, 1891-93, was professor of modern Irish at the national university of Ireland, 1909-32, and one of its senate 1909-19. After the promulgation of the constitution of 1937, Hyde was chosen without opposition as first president of Eire by a conference of representatives of Fianna Fáil, the government party, and Fine Gael, the opposition. He did not seek re-election in 1945, and died July 12, 1949. Besides works in Gaelic, he wrote *Story of Early Irish Literature*, 1897; *Literary History of Ireland*, 1899; *Rafferty's Poems*, ed. 1933; *History of Charlemagne*, 1919.



Douglas Hyde, President of Eire

Hyde Park. A London park. Covering 390 acres, it is bounded E. by Park Lane, W. by Kensing-



Hyde Park. Plan showing chief points of interest in London's principal park. Based upon the Ordnance Survey map with the sanction of the Controller of H.M. Stationery Office

ton Gardens, S. by Knightsbridge, and N. by Bayswater Road. It is intersected by footpaths, a road for private vehicles and taxicabs lies round its edge, and it includes the riding track called Rotten Row, and the Serpentine, an artificial lake formed at Queen Caroline's wish, 1730-33, from ponds originally fed by the Westbourne, and crossed by a bridge built by the brothers Rennie in 1828. The lake affords bathing and boating facilities in the summer, skating in severe winters, and is stocked with wild fowl, who find the island, associated with Barrie's Peter Pan, a congenial retreat. Part of its S. shore, set aside in 1930 as a mixed bathing and sunbathing enclosure, received the popular name of Lansbury's Lido, George Lansbury being the commissioner of works who instituted the amenity. In the Serpentine, in 1816, Harriet Westbrook, Shelley's first wife, committed suicide.

Hyde Park Corner is notable for its triple gateway, erected in 1828 from designs by Burton, with reliefs copied from the Elgin marbles. The so-called Achilles statue (*q.v.*) and the Epstein bas-relief of Rima in the bird sanctuary memorial to W. H. Hudson are notable pieces of sculpture. Near the Albert Gate is The Dell, a small sub-tropical garden. The N. section is comparatively treeless, and has formed the scene of many political and other demonstrations, in connexion with one of which, in 1866, about $\frac{1}{2}$ m. of

the old railings was overthrown by the pressure of the crowd. The annual May Day rally of organized workers takes place here. N.E. of the Ring Tea House, near the site of a circular drive and racecourse of the time of the Stuarts, stood the Reformers' Tree. A 24-hr. guard is still mounted over the powder magazine, lying just N. of the Serpentine bridge. On Sundays and weekday evenings orators of all descriptions are to be heard on the ground near the Marble Arch (*q.v.*). The park was used by the government during the general strike, 1926, as a milk pool and flour store; and an A.A. station was established near Marble Arch during the Second Great War.

The park derives its name from the manor of Hyde, which anciently belonged to the abbey of Westminster. The ground was enclosed and made into a deer park by Henry VIII. Under Charles I it began to be a resort of fashion. During the Civil War it became a camp, afterwards being sold, but its purchasers had to give it up at the Restoration, when the Ring (closed in the reign of George II) became the scene of much frivolity. In 1712 was fought here the famous duel between the duke of Hamilton and Lord Mohun, both being killed. The first great international exhibition was held in the park near Knightsbridge in 1851, the original structure of glass and iron being re-erected at Sydenham as the Crystal Palace (*q.v.*).



Hyderabad. Map of the Indian state between Madras and Bombay

Hyde Park. A homestead in New York state, U.S.A., on the Hudson river. It came to Franklin D. Roosevelt from his father, who had acquired it on retirement from business activities in New York city. Roosevelt was keenly interested in the management of its farms, and greatly appreciated the refreshment that the occupancy of such a house brought him when he was governor of N.Y. state, and later president. In Jan., 1944, he and his wife presented Hyde Park to the U.S. government for use as a national historic site, with the proviso that they and their immediate family could continue to use it during their lifetime. The gift included a valuable library, containing a large number of books, MSS., and other historical material relating to Roosevelt's personal life and political career, and a number of ship models, naval pictures, art objects, and curios. Fifteen months later Roosevelt was buried there.

Hyderabad. Dist. and municipality of the prov. of Sind, Pakistan. The district extends E. from the Indus almost to the Thar desert, and is an alluvial plain cultivable only near the river. The soil yields well when irrigated. The city lies E. of the Indus and is a great rly. junction for Delhi to the N.E., Karachi to the S.W., and the Punjab to the N. It is noted for its silks, gold and silver work, and lacquer. Sir

James Outram defended the residency against the Baluchis in 1843. Area of dist. 4,476 sq. m. Pop. dist., 758,748; town, 127,521.

Hyderabad. Autonomous state of the Union of India, occupying the central portion of the Deccan plateau, and comprising two natural divisions called Marathwara and Telingana, after the principal vernacular, Marathi and Telugu, spoken in each. Marathwara, in the W., is an area of uncertain rainfall and considerable elevation where the rock is mainly Deccan trap, the consequence of an outflow of basaltic lava. This occasions the black cotton soil and gives rise to the chief crops of the division, cotton and wheat. Telingana, on the E., includes the capital city, has a better rainfall, produces rice and pulses, and is the granary of the state. The underlying rocks consist mainly of granite, gneiss, and schist.

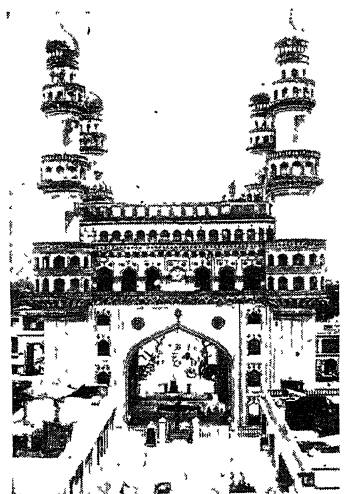
The Mahbubnagar canal takes off from the Manjra river and irrigates a large area in the Medak district N. of the capital, this and other canals and irrigation works (tanks, etc.) add to the productivity of Telingana. The territories of Hyderabad comprise the major portions of the valleys of the great Deccan rivers, Godavari and Kistna. Secunderabad is the chief rly. centre; one line goes past the Warangal coalfield to Bezvada, in Madras; a second goes N. and N.W. to Aurangabad and Manmad, in Bombay; a

third goes W. to Wadi junction, on the main line Madras to Bombay, which here crosses the S.W. of the state; and a fourth goes S. and almost to the Kistna to connect with Kurnool, in Madras. With the exception of the section of main line these rlys. comprise the nizam's Guaranteed State rly.

Treaties with the E. India co. and later with the British government established relations between the nizam and the then paramount power. In 1902 the nizam's sovereignty over Berar was reaffirmed, but it was leased to the govt. of India in perpetuity on an annual rental of Rs. 25 lacs (£187,500). At the same time the Hyderabad contingent, maintained under agreement ever since 1800, was incorporated into the Indian army. An agreement of 1936 reaffirmed the nizam's sovereignty over Berar, but allowed for its administration with the Central Provinces under the Government of India Act, 1935.

Pending the granting of independence to British India, Hyderabad, which had a Muslim ruler, and predominantly Hindu pop., declared, June 12, 1947, for complete independence at the lapse of paramountcy. But, after long negotiations and a show of force by the Indian govt., the nizam agreed to the accession of his state to India, Nov. 24, 1949. Area 82,313 sq. m. Pop. 16,338,534.

Hyderabad. Capital of Hyderabad state and the fourth largest city in the sub-continent of India. The city comprises Anderun (within the walls), 2 sq. m., and Berun (without the walls), 9½ sq. m. The



Hyderabad. Char Minar, built in 1591, at which structure the four principal streets of the city meet

walls are 6 m. round and the whole city area is 50 sq. m. The city is connected by a short rly. with the great rly. junction at Secunderabad. The Jama Masjid is a copy of the mosque at Mecca. The four principal streets meet at the Char Minar, four minarets built upon four huge arches, formerly a college. In Sept., 1908, floods from the Musi washed away 18,000 houses with considerable loss of life, causing many of the inhabitants to leave the riverside districts. Pop. 739,159.

Hydnocarpus Oil. A fixed oil yielded by the fresh, ripe seed of *Hydnocarpus wightiana*, a tall Indian tree commonly known to the natives as *kastel* or *kantel*. The oil has been used for many centuries in the treatment of leprosy. The ingredients are chaulmoogric and hydnocarpic acids.

Hydra (Gr., water-serpent). In Greek mythology, a nine-headed monster. It was the offspring of Typhon and Echidna, which dwelt in a swamp near Lerna, in Argos, and ravaged the neighbouring country. The killing of the hydra was one of the twelve labours of Hercules. As often as the hero struck off one of the monster's heads with his club, two others grew in its place. With the help of his servant, Iolaus, Hercules burned away all the heads and buried under a stone the ninth, which was supposed to be immortal.

Hydra. Southern constellation mentioned by Ptolemy. It is the longest constellation in the sky, beginning close to Procyon under Cancer and stretching below the zodiacal constellations of Cancer, Leo, and Virgo, and part of Libra.

Hydra. Small fresh-water polyp common in ponds in Great Britain, where it attaches itself to the weeds. There are three British species, of which the green hydra is the most common. It consists of a little tube, about $\frac{1}{4}$ in. to $\frac{1}{2}$ in. long, with the mouth surrounded by tentacles which have the power of stinging and paralyzing the minute creatures on which it feeds.

Hydra. Island of Greece, the ancient Hydraea. It lies off the E. coast of the Morea, about 75 m. S.W. of Athens. The town of Hydra is situated on its N. coast, and formerly had a large trade. Hydra, which is 20 sq. m. in area, gives its name to the channel separating it from the mainland.

Hydrangea. Half-hardy flowering shrubs of the family Saxifragaceae. One species, *H. arborescens*, was introduced into England from N. America in 1736. The

familiar common hydrangea (*H. hortensis*) came from China 54 years later. The flowers grow in large compact heads and for the most part have neither pistil nor stamens, but consist of four petaloid sepals. The perfect flowers are small and grow in the centre of the head. The flowers are naturally white and pink, but by treatment with a solution of saltpetre and oxide of iron blue flowers are produced. Many

species thrive in the open air in Great Britain in favoured situations, though generally they require greenhouse treatment.

Hydrant. Pipe, fitted with a valve and an outlet, inserted temporarily or permanently in a water main. The ends of the outlets are screwed so that hose unions can be screwed on. The valves of fire hydrants within a building are usually actuated by hand-wheels. Sometimes the pressure of the mains alone is relied on to propel the water through the hose-line; sometimes a pump is used to boost the pressure.

Street fire hydrants are usually encased in metal surface boxes or in pits below ground, fitted with frost-resisting valves and actuated by lever keys. In another type of hydrant, such as is employed for street watering, the valve is placed below ground and the outlet is extended above ground in a standpost of convenient height.

Hydrate. Chemical compound formed by the union of molecules of water (H_2O) with other molecules or atoms, without any rearrangement of the atoms of the H_2O group. When the H_2O group is rearranged in the new molecule, the resulting compound is termed a hydroxide.

Hydration. Term denoting the chemical combination of water with some other substance. Many anhydrous silicates combine readily with water and the combination is in general accompanied by expansion of volume and liberation of heat. In aqueous solutions of salts in which the salts break up into ions, hydration includes the combination of one or more ions with one or more molecules of water. Crystalline substances soluble in water may combine with water of crystallisation with formation of hydrates; this pro-

cess is one variety of hydration. The hydrates so formed are called monohydrates, dihydrates, etc., according to the number of molecules of water combining with one molecule of the crystalline substance. The energy difference between anhydrous and hydrated compounds is commonly expressed in terms of calories.

Hydraulicking. Method of mining gold, consisting essentially of washing out alluvial gold

and other deposits by means of a powerful jet of water directed against them. This method of gold-mining was first adopted in California about the middle of the 19th century. The gold washed out by hydraulicking is recovered by an elaborate series of sluices, riffles, and other devices through which the streams of water, carrying the washed out deposits of gold in suspension, are directed. See Gold; Mining.

Hydraulics (Gr. *hydōr*, water; *aulos*, a pipe). Term by which is defined that branch of engineering science which treats of the motion of liquids, especially water, and the conveyance of power by means of water-pressure. The underlying principles of the science are necessarily based on the laws of hydrostatics and hydrokinetics, but allowance has to be made in practice for many divergences from the ideal theoretical conditions assumed.

The foundation of hydraulics is the idea of a "head of water." In a vertical pipe filled with water the pressure at any point is the atmospheric pressure, together with that due to the weight of water per unit area supported above this point. If the pipe is bent the pressure at any point at a given depth below the top is the same as the pressure at a point on the same level in the straight pipe, and this pressure is said to be that of a head of water equal to the vertical distance of the point from the top of the pipe.

The water from a reservoir which is situated on a hill can be used to supply the surrounding district, and the head of water at any place in the district is the vertical depth of that place below the source of supply. This is a "natural head"; when a sufficient natural head is not available, and especially when a supply of water under high



Hydrangea. Flower-head of the familiar species, *H. hortensis*

pressure is required, an artificial head is created by means of an accumulator, a tank in which water is kept under great pressure by means of a movable top on which is supported a very heavy weight. Water is pumped into this tank by a steam-engine or otherwise, and gradually lifts the weight. The head thus artificially created is the height of a column of water equal in weight to the heavy mass supported by the water in the tank.

A head of water is a source of energy and can be utilised for the performance of work, such as the driving of turbines, and in hydraulic machinery of all kinds, such as hydraulic presses, lifts, cranes, dock-gates, etc. A head of water of 100 ft. corresponds to an available pressure of nearly 45 lb. to the sq. in., and applied to a surface area of 100 sq. ins. would develop a force of 4,500 lb. The greater the area of application the greater is the force, but the more slowly it works.

Hydraulic Formulae

It is important to bear in mind that hydraulic formulae are based chiefly upon experimental data and that some of them are subjects of dispute, whilst certain practical considerations render it necessary to make ample allowance for inaccuracies: *e.g.* the interior surfaces of pipes may accumulate deposit from water, according to its degree of impurity, and reduce the effective bore, while accumulations of air may also reduce the flow. The following formulae relate to the flow of water through open channels and in pipes running full, but they are merely illustrative.

Since fresh water weighs, on an average, 62.5 lb. per cu. ft., the pressure (p) at a given point h ft. below the surface of a reservoir will be $62.5 h$ lb. per sq. in.

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The nature of what is conveniently termed friction of water flowing in pipes has not yet been definitely ascertained, but it is assumed that resistance to flow is due rather to the friction which does occur setting up a swirling motion, thereby disturbing the even flow of the current. The following are approximate formulae for estimating velocity and rate of discharge in the case of straight, smooth, cylindrical pipes running full, where V = mean velocity in ft. per sec., D = rate of discharge in gallons per second, h = head of water in ft., d = diameter of pipe in ft., a = cross-sectional area of pipe in sq. ft., l = length of pipe in ft., and

m is a coefficient varying from 23 for a 1-in. pipe to 77 for a pipe 10 ft. diameter: $V = m \sqrt{(Dh/54 l d)}$ and $D = 6.24 a V$. The above formula for mean velocity corresponds to Hawksley's, except that the latter adopts for m a constant mean value of 48, which results in considerable differences. These are two of many different formulae. In open channels the mean velocity may be obtained by Kutter's formula: $V = C \sqrt{RS}$, where R = mean hydraulic radius, S = sine of inclination of water surface or the fall, and C is a coefficient obtained by a somewhat complicated formula and partly depending upon the nature of the channel bed and sides or its artificial lining. The rate of discharge $D = 6.24 a V$ in galls. per sec.

Other matters dealt with under hydraulics include flow through orifices and over weirs, gauging instruments, meters, valves, etc. See Siphon.

HYDRAULIC MACHINERY. Machinery using water for motive power takes advantage of the fact that water offers such high resistance to compression that it can be considered as incompressible. It shares with all other fluids the property of transmitting in all directions pressure applied to any part of a body of it; and, as it moves at slow speeds without appreciable friction, it is ideal for the transmission of great force.

The machines and tools in which the energy of water subjected to very high pressure is used are for the most part various applications of the hydraulic press. The first such press was constructed by Joseph Bramah *c.* 1795.

The force exerted by a hydraulic press is PA , where P = pressure in lb. per sq. in. and A = area of a cross-section of the ram in sq. ins. If a pump is used to work the ram, the theoretical mechanical advantage (neglecting friction) is A/a , where A = area of ram and a = area of pump plunger.

Where the main pressure supply is less than that required to oper-

ate the hydraulic machine, an increase in pressure is obtained with an intensifier (*see fig.*). In its simplest form, this consists of a ram of area A carrying a piston of larger area B . Water from the pressure mains at a pressure p is admitted behind the piston B which drives the plunger A into the upper and smaller cylinder C , thus intensifying the pressure in cylinder C to an increased pressure of P . Neglecting friction and the weight of the moving parts, the intensified pressure is shown by the equation

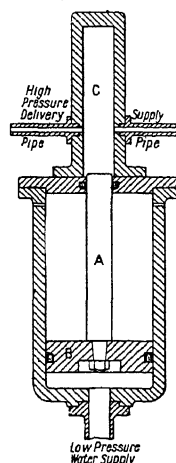
$$P = pB/A$$

Hydraulic Presses used for baling hay, cotton, wool, and other loose materials for shipment are generally supplied with water direct from a number of pumps driven by one engine. As the resistance increases, the pumps are thrown out of action successively to allow the pressure to be increased also by stages. Before the operation is completed the pressure on the ram may rise to 3 tons or more per sq. in. Forging presses, used to shape large ingots for armour plates and big guns, have inverted cylinders, and somewhat resemble a steam hammer in shape. The largest presses exert a force equal to a weight of 15,000–20,000 tons. The forging head attached to the end of the ram (or rams) is T-shaped in section, and squeezes the metal with the narrow bottom edge.

In one passage through the press the thickness of a plate may be reduced by 5 p.c. or more. Gun ingots are drawn out into tubes on removable mandrels; and armour plates are bent to any desired shape on packing pieces above and below, or in dies. During only a small part of a working stroke is very high pressure required; and to avoid waste of power water is not admitted from the intensifier till the press is against its work.

Hydraulic Flangers, etc. Modifications of the press are used to flange the edges of metal plates for boiler ends, firebox sides, etc. With the aid of dies of the required form a plate can be finished to shape at one heat in a few moments and the work will be done better than by the slow and costly hand process. Boiler plates are bent into cylinders by long, narrow girder dies, with concave and convex surfaces, forced together by rams pressing on the ends of one of them.

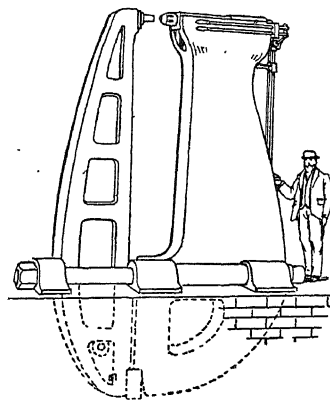
Hydraulic Riveters. The riveting of steel plates for boilers,



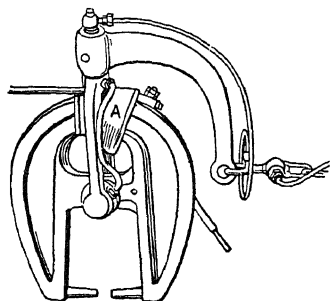
Hydraulic Machinery. Sectional diagram of intensifier. See next column, top

bridges, girders, ships, and constructional work generally is done as far as possible by power riveters, among which the hydraulic takes the first place. Hydraulic riveting is quicker, cheaper, and better than hand work. The closing pressure on the rivet can be gauged exactly, which is not possible when hammers are used. Hydraulic riveters are of two main types. In one type the arms are pinned together at a point between the ends, and act as levers of the first class. A hydraulic press forces them apart at one end and brings the dies against the work at the other. In the solid or "bear" type the arms are part of a heavy casting, and the cupping die is moved by a press immediately behind it. Some presses of this kind have two hydraulic rams, one inside the other. The smaller

Extruding Presses. A sectional view is given of a press by which lead and other metals in a



Hydraulic Machinery. Stationary or "bear" riveter with moving die

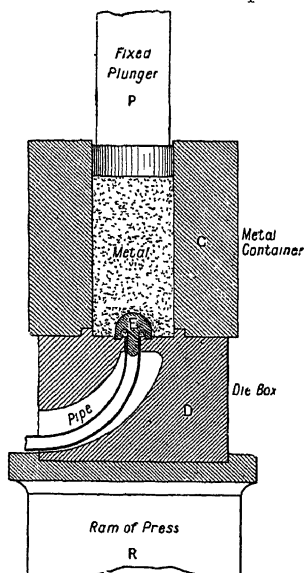


Hydraulic Machinery. Portable riveter with moving arms. A, cylinder

ram operates an annular tool surrounding the die to squeeze the plates to be riveted closely together; the larger drives the die itself. An auxiliary cylinder and piston bring the tools up to their work and retract them. During adjustment the ram cylinders are filled with low-pressure water. The scope of a riveter is limited by the length of its gap—that is to say, the space between the arms, which in the largest machines is about 12 ft.

Hydraulic Jacks. These are very useful portable tools for lifting heavy weights. They have a higher efficiency than the screw-jack. The cylinder of the jack may be fixed, the ram rising, or, alternatively, the jack ram may be fixed with the cylinder rising. The top of the jack contains a small hand-operated force pump and valves, a water chamber, and a by-pass for connecting the latter with the cylinder to lower the jack. Groups of stationary jacks are used for raising the large platforms carrying heavy loads—e.g. in hydraulic dry-docks.

molten or plastic condition are squeezed out through a die as rods and, in the case of lead and soft alloys, as tubes. In the fig. below, R is the ram, D the die-box attached to the top of the ram, C the metal container, and P a fixed plunger fitting the cavity in C very exactly. As R rises and subjects the metal to a pressure of 1-10 tons per sq. in., according to the nature of the metal and the size of bar required, it is forced out through the die E. Lead and "compo" pipes are "squirted" in the same manner, but the die for pipe-making has a core-piece bridging the opening to form the central hole. The lead is separated



Hydraulic Machinery. Pipe extruding press with bridge-die. See text

by the wings of the bridge, but unites again on the farther side. An alternative method uses a hollow upper plunger, P, and a vertical core bar attached to the bottom of C and projecting into R.

Hydraulic Engines producing rotary motion are used to turn winches and capstans and revolve the gun turrets of warships. The Brotherhood engine has three single-acting cylinders with trunk pistons, arranged 120° apart round a central shaft. Water is admitted and released from the cylinders by a disk valve rotated at crank speed. In other engines the cylinders oscillate, and the piston is exposed to pressure on both sides alternately, or on one side only. One form of Armstrong engine has double-acting cylinders. The front face of the piston, half of which is occupied by the piston-rod, is constantly under pressure, the back face only during the outward stroke, when the force is differential. See Accumulator; Bramah Press; Water Power.

Hydrazine OR DI-AMIDOGEN. Colourless liquid which may be regarded as a combination of two amidogen (NH_2) groups. It is a powerful reducing agent, and forms with water a hydrate which has powerful alkaline and corrosive properties. Hydrazine is a reduction product of hyponitrous acid.

Hydrazone. Compound formed by the union of substances containing the carbonyl group (CO) with phenylhydrazine. Some hydrazones are used as dyes.

Hydride. Compound of hydrogen with some other element. The principal hydrides are the compounds of hydrogen with carbon known as hydrocarbons (*q.v.*). In addition, there are hydrides of lithium, sodium, potassium, calcium, strontium, and barium. Boron forms two hydrides, B_2H_6 and B_4H_{10} . Silicon forms a hydride, silane, SiH_4 , and disilane, Si_2H_6 . There are hydrides of germanium and of tin; there is a hydride of palladium, PdH . There are two hydrides of oxygen, H_2O , water, and H_2O_2 , hydrogen peroxide. There are two, hydrides of nitrogen, NH_3 , ammonia gas, and N_2H_4 , hydrazine; and at least three, possibly more, hydrides of phosphorus, the gaseous phosphoretted hydrogen PH_3 , the liquid hydrogen phosphide P_2H_4 , and the solid hydrogen phosphide P_{12}H_6 .

The hydride of sulphur, H_2S , is sulphuretted hydrogen; selenium and tellurium form hydrides, H_2Se and H_2Te . There are also

hydrides of fluorine, HF, of chlorine, HCl, of bromine, HBr, and of iodine, HI. Arsenic forms a hydride, arsenuretted hydrogen or arsine, AsH_3 , and antimony forms a hydride, antimonietted hydrogen or stibine, SbH_3 . The metallic hydrides are solids, the non-metallic hydrides are gasses or liquids.

Hydriodic Acid (HI). Colourless gas with suffocating odour which fumes strongly on contact with the air. It is prepared by gradually adding iodine to a mixture of amorphous phosphorus and water which is kept cool and afterwards gently heated. The gas dissolves in water, the aqueous solution being the form in which, mixed with syrup, it is employed in medicine. The salts of hydriodic acid are called iodides and are, as a rule, soluble in water. Many are commercially important, e.g. silver iodide, the sensitive salt used in photography, potassium, sodium, and mercuric iodides used in medicine. See Gas.

Hydro. Popular abbreviation for hydropathic establishment, where hydropathy (*q.v.*) is practised.

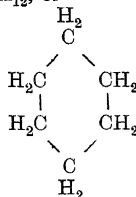
Hydrobromic Acid (HBr). Colourless gas with irritating smell, which gives off white fumes in the air. It is prepared by passing a mixture of hydrogen and bromine vapour over a heated platinum catalyst, or by the action of bromine or red phosphorus in the presence of water. The gas is soluble in water, and can be concentrated to the strength of about 48 p.c. A weaker acid (10 p.c.) is used in medicine.

Hydrocarbon. Term denoting a compound of the two elements, hydrogen and carbon, no other element being present. There are innumerable hydrocarbons, many of which are of considerable scientific and industrial importance, and they can be classified in accordance with the way in which the carbon atoms in the hydrocarbon are joined together, in long chains, or in rings, or in a combination of chains and rings. Starting from methane, CH_4 , the hydrocarbon chains include the paraffins, ethane $\text{H}_3\text{C}-\text{CH}_3$, propane $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_3$, butane $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_3$, three different varieties of pentane, C_5H_{12} , five different varieties of hexane, C_6H_{14} , and many other varieties each with more than six atoms of carbon. These hydrocarbons form what is called a homologous series, by the addition of a CH_2 group to the preceding compound. Another such series starts with the hydro-

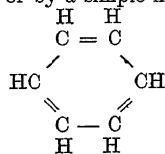
carbon ethylene, C_2H_4 or $\text{H}_2\text{C}=\text{CH}_2$; the next member of this series, propylene, is C_3H_6 or $\text{H}_2\text{C}=\text{CH}-\text{CH}_3$.

Another such series starts with acetylene, C_2H_2 or $\text{HC}\equiv\text{CH}$, and includes methyl acetylene or allylene, $\text{HC}\equiv\text{C}-\text{CH}_3$. Isoprene is C_5H_8 , $\text{H}_2\text{C}=\text{C}-\text{CH}=\text{CH}_2$.

CH_3
Cyclohexane, another hydrocarbon, is C_6H_{12} , or

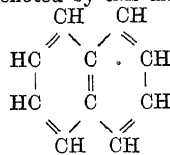


Perhaps the most important hydrocarbon is benzene (*q.v.*), C_6H_6 , usually denoted by this formula or by a simple hexagon.

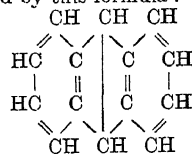


The current view is that an alternation of double and single bonds in the ring does not actually exist; the molecule of benzene is a flat, symmetrical hexagon and the manner in which the carbon atoms are connected together cannot be accurately denoted by any arrangement of single and double bonds, but is something more complicated.

Naphthalene, C_{10}H_8 , is another important hydrocarbon that is conveniently, though not accurately, denoted by this diagram:



Anthrācene, $\text{C}_{14}\text{H}_{10}$, is similarly denoted by this formula:



Many hydrocarbons are obtained from crude petroleum and from the distillation of coal and coal tar. From such simple compounds as methane, acetylene, benzene, and naphthalene, hundreds or thousands of hydrocarbons and other compounds have

been prepared of importance in the manufacture of plastics, drugs, dyestuffs, varnishes, and detergents; many of these are referred to by name in this Encyclopedia. See also Organic Chemistry.

Hydrocele. Term for a condition in which the sac containing the testes fills with fluid. This may be due to mechanical obstruction, possibly following injury, or may result from a pathological condition such as late syphilis, or from back pressure on the portal circulation due to cirrhosis of the liver. It is often necessary for the fluid to be drawn off by the surgeon while the basic condition is treated.

Hydrocephalus (Greek *hydōr*, water; *kephalē*, head). Condition popularly known as water on the brain, due to an excess of the fluid normally in the cavities (ventricles) of the brain. It may be the result of defects present at birth, often associated with congenital syphilis or with consanguinity of the parents; or of inflammation causing pressure on the cerebral blood vessels, when no age is immune. In the child the head gradually enlarges, the forehead bulges, and the patient cannot lift the head from the pillow. Operative treatment is unsuccessful.

Hydrocharitaceae. A family of aquatic herbs, mostly with floating or submerged leaves. The sexes are usually in separate flowers, which have three sepals and three petals; the fruit is mostly a submerged berry. The family is represented in all climates. See Frog-bit; Canadian Pondweed.

Hydrochloric Acid or **MURATIC ACID (HCl).** Liquid prepared by dissolving hydrochloric acid gas in water. Known since the days of the Arabian alchemists, its preparation was first clearly described by Glauber in 1648. Hydrochloric acid is the only known compound of hydrogen and chlorine, and it can be made by the direct union of these elements, equal volumes of these gases mixed and exposed to light combining with explosive violence. It can also be made by heating common salt and sulphuric acid together and passing the gas into water.

The acid is still made on a limited scale as a by-product in the preparation of soda ash. In this process salt is heated with sulphuric acid in large iron pans and the hydrochloric acid, which is produced in large volumes, is conducted into tall towers filled with coke through which water is allowed to trickle. The gas dis-

solves in the water and forms the commercial hydrochloric acid used for producing chlorine and preparing chlorides. Very pure hydrochloric acid is made by combustion of hydrogen and chlorine, formed as by-products in caustic soda manufacture by the electrolytic process.

Hydrochloric acid is an important constituent of the gastric juice, and in medicine is given in suitable doses to remedy a deficiency when this is present; many cases of gastric indigestion, loss of appetite, and flatulence formerly treated with soothing alkalis are now recognized as due to failure of secretion of hydrochloric acid.

Strong hydrochloric acid is a powerful poison, a teaspoonful having proved sufficient to cause death. The symptoms are immediate intense burning pain in the mouth and stomach, followed by violent vomiting and retching; coughing, hoarseness of the voice, and difficulty in breathing may also occur from the fumes of the acid being inhaled into the lungs. The pain spreads over the whole abdomen, a condition of shock supervenes, the pulse becoming small and the skin cold and clammy, and, in severe cases, death occurs in a few hours.

Calced magnesia is the best antidote, but when not available sodium bicarbonate, chalk, plaster from the ceiling, or whiting may be given powdered in water. If none of these substances is at hand, large draughts of water should be given in order to dilute the acid. See Chlorine.

Hydrochloride OR **CHLORIDE**. Compound of chlorine with other elements. The action of hydrochloric acid upon metals and metallic oxides produces water and a chloride of the metal. Chlorides are also produced by dissolving hydrates and carbonates in hydrochloric acid. Chlorine unites with all the non-metallic elements and certain inorganic and organic radicals or groups of elements. Most of the metallic chlorides are soluble in water, but lead chloride only in hot water. Among the insoluble metallic chlorides are silver, mercurous, and cuprous chlorides. Generally the metallic chlorides are solids which readily volatilise, but tin tetrachloride and antimony pentachloride are liquids, and gold and platinum chlorides decompose at high temperatures. Many metals combine in more than one proportion with chlorine, an example being mercurous chloride (calomel) represented by the sym-

bol HgCl , and mercuric chloride (corrosive sublimate), HgCl_2 . The most important chloride is common salt. See Salt.

Hydrocyanic Acid (Gr. *hydōr*, water; *kyanos*, blue) (HCN). A poisonous liquid with a characteristic smell resembling that of bitter almonds, and popularly known as prussic acid. It was discovered by Scheele in 1782, who prepared it by decomposing potassium ferrocyanide by means of sulphuric acid. The acid is produced by distilling potassium or sodium cyanide with dilute sulphuric acid or by passing electric discharges through a mixture of acetylene and hydrogen. Hydrocyanic acid is widely used as a fumigant.

The concentrated acid is readily inflammable and burns with a beautiful violet flame. It is one of the most powerful and rapid of known poisons, and even with dilute solutions fatal results rapidly follow. Half a teaspoonful of the two p.c. solution of the acid, and five grains of potassium cyanide, have been sufficient to cause death. The symptoms come on immediately the poison is taken. The person may be able to run to the door or cry for assistance, but often he is unable to do this and falls to the ground in a state of unconsciousness, frequently after

uttering a piercing shriek. Breathing becomes difficult, the skin purplish, and the lips may be covered with froth; the eyes are staring and glistening; the skin cold and clammy and the pulse almost imperceptible. Vomiting and convulsions may occur. The breathing gradually becomes more laboured and slower, and death eventually occurs from collapse.

Treatment, if the rapid and definite action of the poison allows time for any, consists in the prompt use of the stomach tube or administration of an emetic. Pending the arrival of a doctor, the patient should be given large doses of salt and water or mustard and water. Respiration should be stimulated by holding ammonia to the nostrils and by throwing cold water over the face. The application of a faradic current over the chest has also been recommended. Artificial respiration may be necessary.

Dilute HCN is used in medicine in small dosage in combination with such other drugs as opium and bismuth as an intestinal sedative.

Hydrodynamics. Science which treats of the motions and equilibrium of fluids. The subject is treated under its separate sections Hydrokinetics and Hydrostatics.

HYDRO-ELECTRIC INSTALLATIONS

J. Kennard, M.I.C.E.

A survey of world development in the use of water power for the generation of electricity. Related aspects of the subject are dealt with under Electric Power; Grid; Irrigation; Turbine. See also illustrated articles dealing with individual dams, e.g. Boulder Dam; Dnieper Dam; Grand Coulee Dam

A hydro-electric installation comprises a scheme designed to harness the power of flowing water falling from a height, and to convert this power into electricity. From the time of its conception to its successful completion it demands the highest skill and ingenuity of civil, mechanical, and electrical engineers. The underlying principle is the same in the case of a small installation constructed for the supply of lighting for a single house, or to operate the machinery of a small workshop, as it is where perhaps a million h.p. or more of hydro-electric power is produced, and many exceptional engineering feats have been accomplished to take advantage on a large scale of the energy freely supplied by nature.

Before electricity was discovered, the power of flowing water was used to turn a wheel and thereby to drive a mill. Such

water wheels are still commonly found in operation, particularly where electricity is not available. Operation is cheap and maintenance negligible. The disadvantage of the simple water wheel is that its power cannot be stored, nor can it be economically distributed or applied at any distance from its point of production. By making the water wheel drive a dynamo, or, better still, by diverting the flowing water under pressure to a turbine, electricity can be generated.

The function of the civil engineer is to select the site where the electric power can be produced most economically. Almost invariably the scheme involves the construction of a storage reservoir, to equalise the flow of the river. In other words, some of the large flows and floods of the rainy season have to be conserved so that the (probably inadequate)

quantity of water available in the dry season can be increased. A study of the flow records over as long a period as possible is necessary, and a survey of the river valley must be carried out to enable the engineer to determine the optimum size of the reservoir required, the height of the dam, and the most favourable route and gradient of the aqueduct for conveying the water to the power station. Before detailed designs of the structural work are prepared, a geological investigation is generally undertaken.

Rate and Height of Water Flow

The two principal factors in the determination of the potential power available from any hydro-electric scheme are the average rate of flow of the water and the height through which it is allowed to fall before entering the turbines. Neglecting friction losses, the product of these two factors gives the water horse power (w.h.p.) and the relationship can be simply expressed by the fact that a flow of 1,000,000 gallons per day falling 100 ft. is equivalent to 21 w.h.p. The conversion of this power into electrical energy introduces further losses because hydraulic and other machinery can never be manufactured with an efficiency of 100 p.c.; further, ignoring the efficiency factor, 1 h.p. is convertible to 0.746 kW. If the demand for current is constant throughout the year, and corresponds to the maximum output of the plant, the station is said to have a load factor of 100 p.c.; but usually the number of kilowatt-hours generated in a year is substantially less than the maximum output of the station throughout the year, and this results in a much lower load factor. For the production of metals, for example, a water power scheme which produces complete regulation of flows, so that the power station can be operated throughout the year on a 100 p.c. load factor, is probably the ideal arrangement; but is not necessarily the most economical on the basis of cost per unit of power produced. An alternative, particularly where a varying output of power, and therefore of metal, is to be avoided, is partial regulation of the flow by means of small reservoirs, to provide the base load; supplemented, when the water supply is deficient, by power from oil or steam plant. One great advantage of hydro-electric power compared with steam power, is that in a fully

developed water power scheme, so long as the whole of the energy provided can be absorbed by the system load, the average load factor remains constant, since it is a function only of the installed capacity and the average run-off from the drainage area.

If a water power plant is worked continuously the quantity of water drawn from the reservoirs is constant, and the aqueducts are of minimum cross section and therefore of least cost. Similarly, the power house with its foundations, tail race, and plant is of minimum and most economical size. By reducing the load factor to 50 p.c. the average load is doubled for half the time, and consequently the same works must be doubled in capacity, which materially affects the cost per unit of electricity generated.

At some installations the demand for power fluctuates so much that the demand during peak load hours must be met by the introduction of high-level storage reservoirs. Making use of the surplus energy produced during periods of low demand, water is pumped into the reservoirs, and is subsequently released through turbines to drive electric generators, thereby increasing the capacity of the installation. A number of such plants are in use on the Continent, the first having been built at Zürich in 1882.

Economics of the Installation

The successful development of a hydro-electric installation depends on the net cost at which it can produce electricity. There is such a diversity of factors that no generalisation can be made. The only test is to take the cost of power from an individual site developed to its economic limit and to compare it with the cost of steam power to serve the same market. The general view is that water power, based upon a non-wasting source of energy, costs little beyond capital expenditure.

The cost per unit of electricity generated by any power plant is made up of four items: (a) interest on capital expenditure; (b) sinking fund to amortise the capital; (c) maintenance; (d) operating expenses. In the steam plant the operating expenses include the cost of fuel, and are therefore very much higher than in the hydro-electric plant, of which the operating cost per unit of electricity generated is almost negligible, interest charges forming the major portion of the all-in cost per unit.

Apart from the purely economic aspect, the requirements of the state, particularly from the point of view of national security, must not be disregarded. The First Great War was declared just when the first two plants for the manufacture of synthetic ammonia were in operation in Germany, and during that war three further plants were developed. When the Second Great War broke out, Germany was operating synthetic rubber plants, without which she would probably have been unable to conduct a mechanised war for long. It is doubtful whether Germany could have manufactured either product without her water power supplies.

Production of Metals

Considerable electric power is necessary for the production of metals. According to Sir William Halcrow, a leading British engineer responsible for several important hydro-electric installations in the Scottish Highlands, aluminium requires about 20,000 kWh. (B.Th.U.) per ton—excluding the power required for the mining of the ore. Magnesium also requires 20,000 kWh., zinc 3,500 kWh., and copper 250 kWh. per ton. A plentiful supply of cheap power, not only for operating the electric furnaces, but also for extracting ore from the earth, is thus a vital factor in reducing the cost of production, and the availability of the raw materials within a reasonable distance of the generated power becomes an important consideration. In the production of aluminium, for example, one ton of metal is produced from about 15 tons of raw material.

Electro-metallurgical industries served by water power have been particularly developed in the U.S.A. and in parts of the British Commonwealth. Over 21,000,000 h.p. of hydro-electric power, or about one-third of potential water power, has already been developed in the U.S.A., where many of the schemes are also built for water supply and river regulation. In Canada the development of water power has resulted in that country's becoming of outstanding industrial importance. Over 10,000,000 h.p. is generated, used in the pulp and paper industry, and in the operation of mines, electro-chemical and electro-metallurgical industries, rlys., etc.

Output of electricity from water power in Norway and Sweden is over 5,000,000 h.p.; 85 p.c. of all transport on the state rlys. is elec-

trical, and the large industries, almost without exception, use hydro-electric power. The Swedish plants have been designed and constructed with a high standard of artistic beauty. The Odda scheme in Norway was in operation nearly 40 years ago, and provides some 400,000 h.p. for several most important chemical works. The production of calcium cyanamide, an important fertiliser (see Calcium), consumes a considerable amount of electrical energy.

Italy has also greatly developed its hydro-electric resources. Approximately 60 p.c. of the electrical requirements of France are produced by hydro-electric stations, the total capacity available being something like 10,000,000 h.p.; about one-fifth is used in the electro-metallurgical industries, particularly in the Alps and the Pyrenees, where melted snow in summer and rain in autumn provide large volumes of water. Over 2,000 m. of rly. track were electrified by 1942, and electrification of the Paris to Marseilles line, with branches to Geneva and Caloz, was planned for 1955.

Installations in Spain

Mountainous Spain, with numerous waterfalls harnessed since the beginning of the century, has nearly 400 hydro-electric installations. The Douro waterfalls, near the frontier between Spain and Portugal, have been tapped in one of the boldest and most interesting projects, permitting the formation of a lake nearly 58 m. long, and having a capacity of 6,000,000,000 kWh., or nearly two-thirds of the potential hydro-electric production of the country.

In Switzerland the major part of a considerable number of water power schemes is devoted to the supply of light, heat, and power to the people. Some 95 p.c. of the houses have electricity. The rlys. also use much of Switzerland's 4,000,000 h.p. of hydro-electricity, very few steam trains being in operation now.

The potential power of Germany is in the region of 7,000,000 h.p., but this is insufficient to meet more than a small proportion of its industrial demands, and consequently many steam plants are used in addition. Russia has a very large potential output, though up to the outbreak of the Second Great War only 5 to 10 p.c.—over 30,000,000 h.p.—had been actually developed.

In the U.S.A. one of the most important schemes developed is the Tennessee Valley Authority

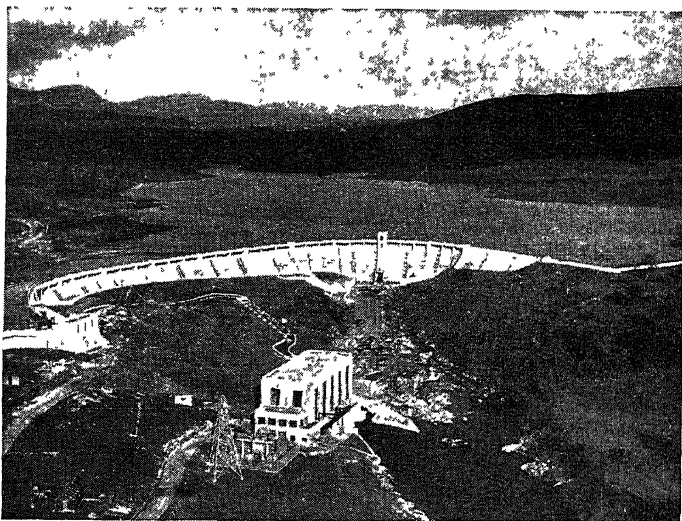
(T.V.A.), constituted in 1933, which not only deals with the water power of the Tennessee river, but also with flood control and navigation, re-afforestation and the proper use of marginal lands, agricultural and industrial development, and national defence by operating the Muscle Shoals chemical plant, where both concentrated phosphates and explosives are manufactured. The total power capacity of the scheme exceeds two million kW., and brings the T.V.A. to second place in the U.S. electric system. (See Tennessee Valley Authority.)

The hydro-electric installation on the Colorado river, U.S.A., is the largest of its kind in the

rather more than 30 p.c. is devoted to the production of metals. It is estimated that the potential power resources of the British Isles exceed 1,600,000 h.p., of which about 500,000 h.p. could be harnessed in Ireland, and 1,000,000 h.p. in Scotland. The formation of the North of Scotland hydro-electric board in 1944 promised considerable development of this valuable asset.

The Galloway Scheme

The Galloway power scheme in Scotland not only provides electricity for the surrounding area, but also makes available a major part of its output to the central electricity authority for use in Clydeside and Merseyside. Com-



Hydro-Electric Installations. General view of the Carsfad works, part of the Galloway scheme in Scotland, described in the text

world. The capacity of the plant installed is 1,835,000 h.p., consisting of 15 main generating units rated at 82,500 kW. each, and two others each of 40,000 kW. capacity. A large proportion of this immense power is transmitted at very high voltage some 200 m. to the city of Los Angeles on the Pacific, and to other large towns; another plant pumps water from the river for domestic and industrial purposes over a considerable area. The development of this scheme necessitated the construction of the famous Boulder dam.

In Great Britain, the principal schemes are in the Highlands of Scotland and in North Wales; elsewhere the country does not lend itself to the production of hydro-electric power. The output of existing schemes amounts to only some 500,000 h.p., of which

pleted in 1935 at a cost of about £3,000,000, its capacity is 150,000 h.p., or approximately 120,000 kW. The scheme was designed on the low load factor of 20 p.c., and normally the stations run at full load for an average of six to eight hrs. per day in winter, and three to four in summer, thus enabling steam stations in central Scotland and N.W. England to run at a more uniform load with consequent saving in the cost of operation. The capital cost per kW. of power available is £28.3; the cost per unit works out at 0.32d. for an output of 180 million units per annum, the annual operating cost being £240,000, inclusive of interest and sinking fund charges. Nine dams were built, ranging in height from 35 to 86 ft., together with five power stations, containing together 11 generating sets. Special

attention was directed to the architectural design of the main structures in consultation with an amenity committee appointed by the secretary of state for Scotland; the results can be judged from the illus. On account of the importance of the Dee and the Don as salmon rivers, fish-passes or ladders were constructed at the dams, to enable the fish to make their way upstream.

Other important hydro-electric works in Scotland are the Lochaber and the Grampian schemes. The first of these cost over £4,000,000 and involved the construction of two impounding reservoirs and a 15-m. tunnel under the Ben Nevis group of mountains. This tunnel conveys the water from Loch Treig to the steel pipe-line leading to the power house. On the way it taps 11 streams through vertical shafts. The capacity of the plant is 120,000 h.p. The load factor is approaching 100 p.c. The Grampian scheme comprises two power stations having a capacity of 110,000 h.p., and involved the construction of the Ericht dam of a height of 45 ft. The load factor is 50 p.c.

The North of Scotland hydro-electric board prepared schemes to serve 141 towns, villages, and hamlets with electricity by means of 571 m. of high-voltage and 361 m. of low-voltage transmission lines, the first major schemes being Loch Sloy (130,000 kW), Tummul-Garry (144,000 kW at three power houses), Affric (66,000 kW), and Fannich (24,000 kW). Schemes under construction in 1949 involved the installation of turbines with a total capacity of 423,000 kW.

The Dnieper Scheme

The Dnieper (Dnieprostroi) hydro-electric scheme in S. Russia, completed in 1932, damaged during the Second Great War, and subsequently repaired, involved the highest engineering skill. The turbines generate about half a million horse-power, and part of it is consumed by the large works constructed along the banks of the river. The rest of the power is transmitted by high voltage lines to more distant industrial regions. In addition, the building of the dam raised the water level over certain shallow portions of the Dnieper river by 120 ft., rendering it navigable for hundreds of miles up from the Black Sea, and transformed the Ukraine into one of the most prosperous industrial and agricultural areas of the Soviet Union.

There are still enormous untapped resources of water power all over the world, and Sir W. Halcrow has estimated that in the British Commonwealth alone over 100,000,000 h.p. (of which only 6 p.c. has been developed), could be made available, as follows:

Country	Potential
Canada and Newfoundland	34,400,000
Honduras	1,000,000
West Indies	150,000
British Guiana	2,500,000
Gold Coast	1,450,000
Sierra Leone	1,700,000
Union of S. Africa and S W Africa	1,750,000
Nigeria	9,000,000
Rhodesia	2,500,000
Tanganyika	2,700,000
British E. Africa and British Central Africa	5,900,000
Bechuanaland	200,000
Egypt	600,000
India, Pakistan, and Ceylon	27,162,300
Malaya and Siam	4,000,000
Australia, New Zealand, and Tasmania	3,800,000
Borneo, New Guinea, and Papua	7,500,000

It is unlikely that all this power will ever be harnessed, as in some areas the work would be uneconomic, owing to difficult site conditions, the absence of raw materials, and the fact that the electrical energy so produced cannot be utilised.

TIDAL POWER. This is the power available from the flow and ebb of the sea tides. The problem of harnessing it is in many respects related to that of harnessing flowing inland water. For many years engineers have been considering ways and means of utilising tidal power successfully; tide mills were, in fact, in operation at the beginning of the 19th cent. The general principle is to construct a barrage across an estuary in such a manner that water flows into an enclosed area through openings, which are closed at high tide. When the tide falls, the difference in level between the impounded water and the sea below the barrage is utilised to drive turbines. This is known as single tide working; double tide working implies the development of power by the rising as well as the falling tide. Allowance must be made for the variation of power output due to the fall of the tide twice a day and the advance by one hour daily of the time of high tide.

A large rise and fall of tide, and a suitable impounding area, provide the best conditions for a tidal power scheme, and special attention has been devoted to the practicability of harnessing the power of the River Severn. In 1945 a committee appointed by

the minister of Fuel and Power reported that the reef known as English Stones was a suitable site for a barrage, operation being by single tide working. At spring tides the maximum power available was estimated to be 800,000 kW. The average annual output of energy would be 2,190 million kWh. which could be used economically in conjunction with existing and new fuel-fired power stations connected to the grid. The estimated capital cost of the scheme was nearly £50 million, whilst the estimated average saving in coal for the first fifteen years of operation was 988,000 tons per annum.

Hydro-Extractor or **CENTRIFUGAL DRIER.** Machine which employs centrifugal force to remove water or other liquid from yarns, cloth, clothes being laundered, sugar, etc. The materials to be dried or separated are placed in a perforated inner drum revolving at high speed within a stationary casing. The whirling action causes the heavier substance (*e.g.* water from clothing, or syrup from sugar crystals) to be thrown off, and it passes out through interstices in the drum. In laundry work the hydro-extractor has replaced the wringer in expressing water from clothes. The machine is illustrated under Laundry. Centrifugal extractors are used in industry for preparing or separating all kinds of substances.

Hydrofluoric Acid or **HYDROGEN FLUORIDE (HF).** Corrosive colourless liquid first prepared by Scheele in 1771. It is usually made by the decomposition of fluorspar by strong sulphuric acid. The vessels used for the process must be of platinum or lead, as the acid acts readily on glass and earthenware. The pure acid is a dangerously corrosive substance, the inhalation of the vapour rapidly causing death.

Hydrofluoric acid is stored in gutta-percha bottles or in glass bottles the inner surface of which has been coated with paraffin wax. The chief use of hydrofluoric acid is for etching glass by the action of the acid on the silica in the glass: the glass is coated with wax, the lines to be etched are scratched with a metal point, and the glass is exposed to the action of the acid.

Hydrofluosilic Acid or **SILICOFLUORIC ACID (H₂SiF₆).** Corrosive compound formed by leading silicon tetrafluoride into water. Silicon tetrafluoride is prepared by heating in a stoneware vessel a mixture of fluorspar, sand, or powdered glass

with sulphuric acid. The acid is sometimes employed as a test for potassium salts, and fluosilicates have been used as antiseptics.

Hydrogen (Gr. *hydōr*, water; *gen.*, to generate) (H). The simplest chemical element and the lightest known gas. Hydrogen has been liquefied and solidified; its melting point is -259°C . and boiling point -252.8° . It is colourless and only slightly soluble in water. It was first investigated in 1766, by Cavendish, who called it inflammable air. It has the atomic weight of 1.0080, and exists as a mixture of isotopes: (1) ordinary hydrogen, 99.98 p.c.; (2) heavy hydrogen or deuterium (atomic weight 2) 0.02 p.c.; (3) traces of a heavier radio-active isotope (atomic weight 3) called tritium. Hydrogen is contained in coal gas and in petroleum; it is conveniently prepared on a small scale by the action of an acid on iron or zinc. On the large scale it is prepared by the electrolysis of water and by the catalysis of water gas using a catalyst of iron containing various other metallic oxides.

Universal Distribution

Hydrogen is contained in the atmosphere of the sun and many stars, and it forms an essential element in every acid. It is also contained in all the carbohydrates and in thousands of other organic compounds. It enters into the hydrogenation of fats.

The atom of hydrogen consists of one proton (*q.v.*) and one external electron, two such atoms combining to make one molecule of hydrogen. Theoretical considerations tend to prove that each hydrogen atom is spinning in space, some spinning in one direction, others in the contrary direction. In the molecule the two atoms may be spinning in the same direction or in opposite directions, and consequently there are two varieties of the hydrogen molecule. When the two atoms spin in the same direction the molecule is called orthohydrogen; when in opposing directions, the molecule is called parahydrogen; the parahydrogen appears to be more stable at very low temperatures. Slight differences in melting points and vapour pressures of the two varieties have been recorded. See Deuterium; Heavy Hydrogen; Hydride; Hydrocarbon.

Hydrogenation. Term for the process by which hydrogen is combined with a substance, used in particular of such combination with coal, tar, oil, and other carbonaceous materials. The treat-

ment is carried out in the presence of a catalyst at high temperatures (400 – 500°C .) and high pressures of hydrogen (200 – 700 atmospheres) and normally results in the addition of hydrogen, the removal of combined oxygen, nitrogen, and sulphur as water, ammonia, and hydrogen sulphide, and the breakdown of the raw material into substances of lower molecular weight. The main product of hydrogenation is high-grade motor spirit or aviation spirit; others are fuel oil, diesel oil, lubricating oil, and hydrocarbon gases.

First Commercial Plant at Leuna

Experiments were carried out in Germany in the early years of the 20th cent. by F. Bergius. The first commercial hydrogenation plant was set up in 1927 at Leuna, Germany, for the treatment of brown coal. Bituminous coal was used in experiments in Great Britain.

In the process used at Leuna, brown coal with about 4 p.c. of an iron oxide catalyst is dried, powdered, and made into a paste with an approximately equal quantity of heavy oil obtained from the process. The paste is then pumped with hydrogen to the plant at a pressure of 230 atmospheres. After passing through a heat exchanger and a preheater, the reactants enter the first converter at a temperature of 430°C . which is raised rapidly by the heat of reaction to 490°C .; this temperature is maintained by the introduction of cold hydrogen at suitable points. The liquid products from this first or liquid-phase stage of coal hydrogenation are then separated by means of distillation into heavy oil (boiling above 325°C .), middle oil (boiling 180 – 325°C .), and spirit (petrol). The heavy oil is used at the earlier stage of the process to make the powdered coal into a paste. The middle oil (sometimes with the spirit) is hydrogenated over a bed of fixed catalyst in the vapour-phase process, usually carried out at 300 atmospheres in two stages.

In the first stage (saturation) the catalyst is pelleted tungsten sulphide, and the oil is treated at 400 – 410°C . for the removal of oxygen, sulphur, and particularly nitrogen which has a deleterious effect in the second stage (splitting). The product from saturation, after distillation if necessary to remove spirit, is treated at 400 – 410°C . in the splitting stage over a catalyst consisting of tungsten sulphide (10 p.c.) supported on activated earth; the oil obtained is distilled to yield

spirit as a main product, and residual middle oil is put through the process again. For the hydrogenation of brown coal tar, the tar is distilled, and heavy oil boiling above 325°C . is treated in the liquid phase, while middle oil from this treatment, together with the distillate from the tar, is treated in the two-stage vapour-phase process. Tar distillates, such as creosote, are treated directly in the two stage vapour-phase process, while petroleum oils substantially free from nitrogen can be treated solely by vapour-phase splitting hydrogenation.

The hydrogenation of bituminous coal is more difficult; it is done by a similar process using a pressure of 300 atmospheres, a reaction temperature of 460 – 470°C ., and a more active catalyst (tin oxalate and ammonium chloride) in the liquid phase. During the Second Great War Germany achieved a slightly improved conversion to oil by operation at 700 atmospheres and 470 – 480°C . using a simpler and more readily available iron catalyst. Similarly the 700-atmospheres liquid-phase process with a reaction temperature of 480°C . was used for the treatment of pitch and heavy oil from bituminous coal tar, and heavy petroleum residues.

Yield of Motor Spirit

The yield of motor spirit is generally about 60 p.c. from bituminous coal (calculated on an ash- and moisture-free basis), and 80–90 p.c. from bituminous coal tar. The consumption of hydrogen is about 15 p.c. by wt. of the ash- and moisture-free coal. Additional coal is required for power and hydrogen production, and the consumption of coal to produce 1 ton of spirit is about 5 tons.

The quality of the products depends on the nature of the raw material and the treatment. The hydrogenation of bituminous coal in Germany gave aviation base spirit of octane number 72 (C.F.R. motor method), which was increased to 90 by the addition of 1.15 ml. tetraethyl lead per litre. Brown coal tar gave motor spirit of octane number 62–64 and aviation base spirit of 68. Ratings for spirits from brown coal were about two units higher; diesel oil from the same process had a cetane number of 40–42.

C. M. Cawley, Ph.D., F.R.I.C.

Hydrogen Bomb. See Atomic Bomb in N.V.

Hydrogen Peroxide (H_2O_2). Colourless or faintly bluish liquid, an unstable compound of hydrogen

and oxygen. It was discovered in 1818 by Thénard, who prepared it by the action of dilute hydrochloric acid on barium peroxide. It can be prepared on the commercial scale by several methods, e.g. by dissolving barium peroxide in water and adding sulphuric acid. Commercial solutions of hydrogen peroxide are sold in several strengths from 10, 12, and up to 100 volumes, i.e. aqueous solutions containing sufficient to yield 10, 12, or 100 times their own volume of oxygen when decomposed.

The chief use of hydrogen peroxide is as a bleaching agent. In medicine it is used as an antiseptic wash for wounds.

Hydrography. Branch of physical science which deals with the surface waters of the earth. Hydrographical research consists chiefly in the obtaining and preparation of material for navigation, etc., and is an important part of the work of the navies of all nations in peace time. The first important hydrographical survey was that carried out over a number of years by Captain James Cook (*q.v.*), who surveyed the St. Lawrence River from Quebec to the sea, the coasts of Newfoundland and Labrador, and the N. and S. Pacific Oceans. In 1795 was founded the British Hydrographic Office, an office which now has a counterpart in the administration of most civilized nations. At its head is the hydrographer of the navy, who is the official adviser on all hydrographical survey.

The preparation of navigation charts and their constant revision, the surveying of harbours and compilation of data, and issuing of directions to navigators; the reporting of derelicts, areas of fog and icebergs, etc., shifting shoals, varying currents, etc., all come within the scope of hydrography.

A hydrographic survey is necessary whenever there is any extensive interference with a natural drainage system, e.g. such work as the irrigation dams of the Nile, Euphrates, etc. See Chart; Ocean; Meteorology; Navigation.

Hydrokinetics (Gr. *hydōr*, water; *kinein*, to move). Science of fluids in motion. The fluids considered are understood to be "perfect fluids," in which there is no friction or viscosity between one part of the fluid and another, and the results obtained are often subject to considerable modification in their application to actual fluids, such as water, in which viscosity exists. Certain general principles are universally applicable.

Consider a river flowing with uniform speed between parallel banks, and imagine that the stream first narrows and then recovers its original breadth, the depth being constant throughout. The velocity of the stream increases at the narrow part, since the same quantity of water has to pass this point in a given time as passes any other point on the bank. The way in which the speed of a stream varies inversely with its cross-section is known as the "law of continuity." Another fundamental law, due to Bernoulli, states that in steady flow the sum of the potential energy, the pressure energy, and the kinetic energy of a fluid remains constant: therefore the pressure diminishes as the velocity increases, and increases as the velocity diminishes.

When water is allowed to escape through a small hole in the side or bottom of a vessel open at the top, the theoretical velocity of the jet depends on the height of the water-level above the hole, and is exactly as great as would have been acquired by the water in falling freely a distance equal to this height. In practice, however, owing to friction, the velocity of the escaping jet is somewhat less.

Wave Motion

One of the most interesting and important forms of fluid motion is wave motion. This may be defined as a periodic or rhythmic motion transmitted through a fluid. The most familiar example, that of the waves on the sea, exhibits the appearance of waves making their way over the surface of the water, but the actual motion of the water is oscillatory. The waves set up by a moving ship are important, as much of the energy of the ship's engines is absorbed in producing them. A different type of fluid wave is the sound wave, which occasions at every point of its passage through air or water an alternate compression and rarefaction of the fluid. Attention has recently been called to the possibility of transmitting a periodic impulse by means of water waves of the same general type as sound waves; this method has already found more than one practical application. See Hydraulics; Wave Power.

Hydrolysis. The breaking down of a substance into simpler or different substances by the addition of water. Thus, ferric chloride, FeCl_3 , when dissolved in water so as to make a dilute solution, produces the hydrate, $\text{Fe}(\text{OH})_3$, and hydrochloric acid, HCl . Cane sugar, $\text{C}_{12}\text{H}_{22}\text{O}_{11}$,

when dissolved in water containing a small amount of acid, breaks up into a mixture of glucose, $\text{C}_6\text{H}_{12}\text{O}_6$, and levulose, $\text{C}_6\text{H}_{12}\text{O}_6$; cane sugar is similarly hydrolysed by water containing yeast. It should be borne in mind that liquid water is not merely a collection of molecules of H_2O but that it contains hydrogen ions, H , and hydroxyl ions, OH , constantly uniting and breaking up again. Hydrolysis is responsible for the assimilation of food by the bodies of animals, the active agents in this process being catalysts known as *enz. mes.*

Hydromel (Gr. *hydōr*, water; *meli*, honey). Beverage made of honey and water. It is usually fermented (then known as mead), and flavoured with spices or hops. It was known to the Greeks and Romans, and when mixed with wine it was called *mulsum*. In medieval times in Great Britain a similar drink was called "clarre" or "piment." See Honey; Mead.

Hydrometallurgy. Term used to describe that branch of metallurgy in which large quantities of water are used for the extraction of metals from their ores. Apart from gold (*q.v.*), copper is the chief metal to be extracted in this way, though only under certain conditions. In general, if the ore is rich, it is far more economical either to concentrate the metallic minerals and smelt, or to smelt the ore direct. But for low-grade ores, if the copper is in a form soluble in water, dilute acids, or ammonia, or can be readily converted to such a form, e.g. by roasting, it is economical to dissolve the copper from the ore, and recover it from the solution. Originally these processes were carried out by nature, the ore body became oxidised in the summer, and when the rain came it leached the copper out of the ore. Much of the copper recovered from the Rio Tinto mines was accumulated in this way. Such leaching has been carried out artificially, but usually the ore is crushed, piled into heaps or into large tanks or vats, and mixed with water. The solution is then circulated or agitated until the copper is dissolved. Copper is recovered from the solution either by adding scrap iron, which precipitates the copper in an impure form, or electrolytically, which, although more expensive, gives a purer product. At many mines the tailings dumps from the concentration processes for smelting are now treated by wet methods to recover copper previously

wasted. See Copper; Electro-metallurgy; Metallurgy.

Hydrometer (Gr. *hydōr*, water; *metron*, measure). Instrument for comparing the densities of liquids. The volume of a body immersed floating in a liquid depends on the density of the liquid, the weight of the liquid displaced being equal to the weight of the body, and this weight of liquid equals the volume of the body immersed multiplied by the density of the liquid. Hence the volume of a body immersed in different liquids can be used to compare the densities of the liquids.

A type of instrument commonly used consists of a glass bulb above which is a graduated glass rod, and below a smaller bulb which can be loaded by varying the density of circular weights; the number on the weight is added to the scale reading. A similar hydrometer, made entirely of metal and known as Sykes's hydrometer, is used by the excise authorities in determining the specific gravity of beers and spirits. Another similar instrument called a lactometer is used to find the s.g. of milk. Because of the sensitivity of measurement required, the same instrument cannot be satisfactorily used for different liquids or solutions.

An alternative to the Sykes's hydrometer, the Twaddell hydrometer, composed of six instruments each with a short stem (narrow for maximum sensitivity) and loaded with different weights of mercury in the lower glass bulb, cannot be used for liquids of lower density than water.

Nicholson's hydrometer, the hydrometer of constant immersion, is a laboratory instrument. It has a pan on its upper end upon which weights can be placed. From the different weights placed in this pan to cause the hydrometer to sink to a fixed level in different liquids the density of those liquids can be calculated. With this form of hydrometer, which also has a pan at its lower end, the specific gravity of some solids can be found.

Hydromica. General name for a group of minerals characterised

by a micaceous habit and resembling normal micas in composition; their foliae are, however, less elastic. This rather vague group name is usually applied to secondary micas which cannot be positively identified (e.g. sericite). They are often derived by alteration of primary minerals in rocks. Although often hydrous, it does not appear that hydromica need necessarily contain more water than ordinary mica, but it may give it off more readily on heating. See Mica; Muscovite, etc.

Hydronephrosis. Condition in which the normal cavities of the kidney fill and dilate through the presence of sterile urine caused by back pressure in some of the lower lying adjacent structures of the urinary tract, which pressure is due to stricture or tumour. The condition may be congenital. If the condition is slight, there may be no symptoms; if it is severe there is pain, frequency of micturition, and possibly blood in the urine. Diagnosis depends mainly on an X-ray of the parts after they have been rendered opaque by an injection of lipiodol into the veins. Treatment varies from the wearing of a supporting belt to the removal of the kidney.

Hydrophathy (Gr. *hydōr*, water; *pathos*, suffering). Treatment of disease by water. Establishments exist to give this treatment, which has an important medical function. The drinking of medicinal waters, wet packs hot or cold, specialised baths, and so forth, relieve certain forms of disease, such as rheumatism, gout, blood pressure.

Among the ancients, treatment by water was advocated by Hippocrates and Asclepiades. According to Suetonius, the emperor Augustus and the poet Horace were restored to health by cold baths prescribed by Antonius Musa. In the 7th and 8th centuries cold effusions were resorted to in the treatment of affections of the head, and in the 12th century treatment by water was advocated for the cure of dysentery.

The action of water applied to the skin is in the first instance thermic and mechanical, the effect being to stimulate the peripheral nerve endings. The effect of cold baths is to contract the small blood vessels in the skin, thus bringing about a rise in the general blood pressure and stimulating the circulation. Heat, however, is abstracted from the body. For this reason cold baths are beneficial to the young and healthy, but should be resorted to with discretion by

those past middle age or those in whom the circulation is not active. Cold baths, cold packs, or ice packs are used to reduce the temperature in fever. An ice cap applied to the head in meningitis and affections of the brain is of value. Warm baths have a soothing effect upon the nervous system, and sometimes relieve pain. A very hot quick bath relieves fatigue, but immersion must be short. Hot fomentations relieve localised pain and inflammation. Cold packs may, however, be preferred. Heat attracts the blood into dilated blood vessels when the white cells attack the cause of inflammation; cold shrinks the vessels and drives away the blood.

It was formerly held that the drinking of large quantities of water washed out and purified the body. This was not borne out by experience; on the contrary, digestion was apt to be impaired and the kidneys were overworked. In some forms of dyspepsia a glass of hot water is of service, and in acute infectious diseases cold water may be taken every two hours. To get special results in special conditions, many different baths and douches are used. See Baths; Spa.

Hydrophobia (Gr. *hydōr*, water; *phobos*, fear) OR RABIES. Acute disease due to a filterable virus located in the salivary glands and central nervous system, transmitted by inoculation, usually by a bite. Dogs are most frequently affected. As a result of the muzzling of dogs order, 1897, the disease was eliminated in Britain. Re-introduced towards the end of 1918, it was stamped out again.

It is by no means certain that a person bitten by a rabid dog will develop the disease. The period between infection and the appearance of the symptoms is variable, in most cases ranging from six to eight weeks. The nearer to the head the bite is, the shorter is the incubation. In dogs the course of the disease is quicker than in man; the animal becomes vicious, there is quick onset of paralysis, followed by death within a week.

The early symptoms in man are pain and irritation in the neighbourhood of the bite, headache, loss of appetite, depression, irritability, sleeplessness, and some difficulty in swallowing. As the disease progresses the excitability increases, and any slight shock or sudden noise will cause a violent spasm, particularly affecting the muscles of the throat and mouth. A spasm may be produced by any



attempt to drink, hence the name hydrophobia, or "fear of water," given to the disease. In man, once symptoms appear, the disease ends fatally, death occurring from exhaustion and paralysis.

Pasteur found that when the poisonous material was injected into a rabbit, and another rabbit was inoculated from the first, and so on through a series, the virulence increased, and the incubation period could be gradually reduced to seven days. The toxic material is present in the spinal cords of these rabbits, but gradually diminishes when they are preserved in dry air. If now a dog is inoculated from the material in a cord with only a weak degree of the virus, and then successively from cords containing the virus in stronger forms, the dog gradually acquires immunity to the disease. Similar treatment of human beings during the incubation period by inoculation with virus or emulsions made from the dried spinal cords of inoculated rabbits brought the mortality rate down to one p.c. No specific treatment for the spasms, once present, is known. Curare, chloroform, and morphia help to alleviate distress.

Hydrophone. An instrument, perfected during the First Great War, which detected the presence of submarines by their sounds. It was lowered into the water, and consisted essentially of a heavy metal ring carrying a thin steel diaphragm with a small water-tight capsule attached at its centre. The capsule contained a granular carbon microphone, connected by wires to a receiver in the ship. A trained listener could distinguish between the sounds emitted by different types of underwater craft. During the Second Great War piezo-electric hydrophones were developed; these made use of ultrasonic waves in the detection and location of submarines.

Hydrophyte. Term applied to plants which habitually live in water, often used especially of water-inhabiting flowering plants to emphasise their water habitat. Some hydrophytes grow rooted in the mud at the bottom and extend their relatively flexuous stems or their leaf stalks upwards so that the simple blades of most of their leaves float on the surface (*e.g.* water buttercup; water lily). Leaves that remain immersed are frequently very thin or much divided so as to provide an extensive surface for carbon-dioxide absorption from the water. Two

contrasting forms of leaf may occur in one plant, *e.g.* the water buttercup has simple floating leaves and submerged leaves divided into numerous, almost thread-like strands. Some plants (*e.g.* arrowhead) have a third form of leaf which projects into the air; other rooted water plants form relatively stout stems (*e.g.* mare's tail) the upper parts of which project into the air.

A number of hydrophytes float freely on the water surface (*e.g.* duckweed; frog-bit), their roots dangling more, perhaps, to keep the plant right way up than for absorption, as this occurs through all the immersed surfaces of water plants. A third category of hydrophytes is rootless (*e.g.* bladderwort; hornwort) and usually lies below the water surface.

Hydrophytes commonly have poorly developed xylem and their immersed parts are devoid of stomata. Intercellular spaces are strongly developed and are used to store oxygen produced during photosynthesis. Most raise their flowers into the air for wind or insect pollination, though a few (*e.g.* hornwort) produce their flowers under the water, by the movements of which pollination is effected.

Hydroplane. A flat-bottomed craft, usually motor-driven, and capable of skimming over water at a high speed. The term was at one time misapplied to aircraft which take off from water (seaplanes). Used as a verb, however, the word can be correctly applied to the progress of a seaplane skimming water with hull or floats partially immersed.

Hydroponics. Science of growing crops in liquid culture media without soil. Hydroponics developed from the old horticultural curiosity of growing watercress on a layer of damp flannel. In order to achieve healthy growth, a plant requires air, water, and light, and certain chemical elements. The correct chemical fertilisers mixed with even poor soil ensure rapid and sturdy growth, but it was long believed that fertilisers were a secondary contribution to plant growth, and that soil was the first essential. In 1927 experiments began at East Malling agricultural research station which demonstrated that crops could be raised without soil if plants were supplied with balanced chemical compounds in solution.

The method used in hydroponics varies with the species of the plant and the size of crop desired.

Maize, corn, or grass can be grown for cattle fodder in a special cabinet, made of galvanised iron, measuring 8 ft. square by 6 ft. high. The interior is fitted with racks to hold 64 galvanised-iron trays in four tiers, while below the tiers is space for a further 16 trays in tiers of four resting on the bottom of the cabinet.

Each tray is stamped with alternate rows of perforations and wells; the latter, resembling small thimbles, hold sufficient of the nutrient solution to feed the germinating seeds and their sprouts for 24 hrs. Above each tier of trays is a finely-perforated spreader, capable of saturating the trays evenly, and connected to a 50-gall. tank of nutrient solution on top of the cabinet.

Six lb. of seed is sown in each of the two lower trays of the four tiers resting on the bottom of the cabinet (eight trays in all), the seeds being so spread that only a few lie in each well. Evenly distributed by the spreaders, the solution pours down from the top of the cabinet and percolates through the perforations in the trays until it reaches the bottom trays of seed. When these have been covered it is turned off. At the end of 24 hrs. the saturated seeds are sprouting and are transferred in their trays to the top rack, eight more trays of newly-sown seed being placed in the bottom of the cabinet.

This procedure is repeated until all the trays are filled with seeds and shoots in various stages of growth. On the 11th day the first sowing has reached a growth of 10 ins., and the roots have formed a mat about an in. thick. The crop is at its most nourishing as cattle fodder, and can be removed from the trays and given to the animals as it stands; 10 lb. of fodder so grown are equivalent to 30 lb. raised from the soil. The phosphorus content is 600 p.p.m., the lime content 300 p.p.m. Working to capacity, an 80-tray cabinet produces 2 cwt. of fodder daily in a 10-day cycle, eight trays of fodder coming out each day and eight trays of freshly-sown seeds going in.

Fruit and vegetables can be cultivated hydroponically by an identical process. The cost is higher than that of normal soil culture; but the system was used in Japan to grow food for the Allied occupation troops.

Hydroquinone, HYDROKINONE, OR QUINOL (para-dihydroxybenzene, $C_6H_4(OH)_2$). Fine white

needle crystals much used as a photographic developing agent, especially in conjunction with metol (*q.v.*). First prepared by the French chemists Caventou and Pelletier, it is readily formed by the combination of hydrogen and quinone, an oxidation product of quinic acid. Its photographic uses were discovered by Abney in 1880. *See* Developer.

Hydrosphere. Term for the (incomplete) envelope of water on the earth's crust. It includes the great oceans with their numerous arms and the great inland seas.

Hydrostatic Balance. Laboratory instrument used for the determination of the s.g. of solids and liquids. Its working is based on the principle of Archimedes. It is a balance with one pan smaller than the other and suspended at a shorter distance from the beam. In this way bodies immersed in liquid are more easily accommodated below it.

Hydrostatics. (Gr. *hydōr*, water; *statikos*, causing to stand). Branch of physical science which deals with the equilibrium of fluids under the application of forces. A fluid at rest exerts pressure at right angles to any surface in contact with it, and this pressure is of equal intensity in all directions. According to Pascal's law of "transmissibility of fluid pressure," any increase of pressure at one point of a fluid in equilibrium is at once transmitted without diminution to every other point of the fluid. Thus water under pressure may be used to transmit a force from one point to another—the principle which lies at the basis of all hydraulic pressure machinery.

In the case of a fluid at rest under gravity, the pressure steadily increases with the depth below the surface, owing to the weight of supported fluid. All objects on the earth's surface are exposed to an atmospheric pressure, at sea level, of nearly 15 lb. to the sq. in., *i.e.* the weight of air which each sq. in. of the earth's surface has to sustain. At the top of Mount Everest the pressure per sq. in. is less than 5 lb., and the difference between this and the normal pressure is equivalent to the weight of a column of air equal to Mt. Everest in height and 1 sq. in. in section. In a similar way water pressure increases with the depth below the surface of the sea: at the surface it is equal to the atmospheric pressure; at the depth of 33 ft. this pressure is doubled, and it increases by one

"atmosphere" for each further 33 ft. of depth. There is, however, an important difference between liquids and gases in that liquids are almost incompressible, while gases are easily compressed. The density of a gas varies directly with the pressure, so that air at sea level is three times as dense as at the summit of Mt. Everest, but water is so little compressible that the increase of density at the bottom of the deepest sea (6 miles) is less than 4 p.c., even under the pressure of 14,000 lb. to the sq. in.

The total pressure of a fluid on a body immersed in it is given by the principle of Archimedes, which states that the resultant upward thrust of the fluid on the body is equal to the weight of the fluid which it displaces. When, for example, a submarine is completely submerged, it is pressed downwards by the water in contact with the upper half of its hull, and upwards by the water in contact with the lower half, but the pressure being greater at the greater depth there is a resultant upward thrust, which is just that which would suffice to balance the water displaced by the submarine. This law follows at once from the consideration that the displaced water was actually held in this position by the pressure of the surrounding fluid before the arrival of the submarine. In order that a submarine may remain submerged at the same level, therefore, its average density must be the same as that of the water. A surface ship sinks in the water until it displaces exactly its own weight of fluid; the upward thrust of the water is then just enough to balance the weight of the ship. The same principle applies to the equilibrium of an airship; the weight of air displaced is exactly equal to the total weight of the airship.

It follows from the principle of Archimedes that if a ship is to float its average density must be less than that of water; a steel ship floats because its average density is reduced to this point by the enclosed air. The shipbuilder has to secure not only the buoyancy of his ship, but also its stability; after rolling or pitching through not too large an angle it must be able to return to its upright position. *See* Hydraulics; Hydrokinetics.

Hydrotherapy. System of treating certain diseases by baths and mineral waters. It is thus a variant of hydropathy (*q.v.*).

Hydrothermal Deposits (Gr. *hydōr*, water; *thermos*, warm). Geologic deposits formed by permeation by hot waters of rocks or

of fissures and joints in rocks. During the emplacement of an igneous rock, such as granite or granodiorite, the activity of hot water solutions in the cooler invaded rock may give rise to contact metamorphic or pyrometamorphic deposits. During the later stages of consolidation of the igneous rock, important water-rich derivatives—often containing concentrations of the ore-metals—emanate from the centre of igneous activity. These solutions may effect profound changes by soaking into the solid rock, or they may ascend through fissures in which they may form barren veins or economic deposits of the ore-metals. According to the conditions at the time of deposition, such deposits are subdivided into hypothermal (high temperature, high pressure), mesothermal (moderate temperature, moderate pressure), and epithermal (low temperature, low pressure) deposits; less used subdivisions include the groups leptothermal, telethermal, and xenothermal (high temperature, low pressure) deposits. *See* Geology.

Hydroxylamine (NH_2OH). A colourless, crystalline substance which explodes violently when heated. Discovered by Lossen in 1865, it was obtained by the action of nascent hydrogen upon ethyl nitrate, the hydrogen being obtained from tin and hydrochloric acid. The hydrochloride is used as a photographic developer and in organic apothecies.

Hydrozoa (Gr. *hydōr*, water; *zōon*, animal). Class of the zoological phylum Coelenterata (*q.v.*). They are commonly known as polyps, are in most cases marine, and usually of small size. While some swim freely, the majority are attached in adult life to rocks, shells, and plants. In their simplest form, the body consists of a bag with a single opening, usually surrounded with tentacles that assist in the capture of the minute organisms on which the animal feeds. Of the orders into which they are divided, the hydromedusae in their adult stage are generally fixed to foreign substances. The hydrocorallines produce a hard calcareous skeleton reminiscent of the true corals (*q.v.*). The Siphonophora swim freely, the Portuguese man-of-war being the best known example.

Hydrus. Southern constellation named by Bayer in 1603. It is near the lesser Magellanic cloud in the S. hemisphere.

Hyena. This mammal is more correctly spelt *hyaena* (*q.v.*).

Hyères. Town of France, in the dept. of Var. One of the most pleasant of the smaller resorts of S. France, it lies about 14 m. by rly. E. of Toulon, and $2\frac{1}{2}$ m. from the sea. The mild, equable climate brings many visitors. R. L. Stevenson resided here in 1883; and fine villas and hotels, a casino, and several large nurseries developed. The town was damaged in heavy fighting before its liberation by French troops, Aug. 22, 1944, during the Second Great War. Salt is produced in large quantities at the Salins d'Hyères, 5 m. E. The Îles d'Hyères, Porquerolles, Port Cros and Levant Islands, were known to the Romans as the Stoechades; they lie off the bay and peninsula of Giens. Pop. 23,654.

Hygieia. In Greek mythology, the goddess of health. The reputed daughter of Asklepios (Aesculapius), she was worshipped in different parts of Greece. She is not to be confused with Athena Hygieia. The worship of Hygieia was introduced into Rome in 293 B.C., where she was at first called Valetudo, and later Salus, the name of a native Italian deity. In art Hygieia was represented wearing a long robe, sometimes feeding the serpent twined on the staff which was the attribute of Aesculapius (*q.v.*).

Hygiene (Gr. *hygieinos*, healthy). Science of the preservation of health and the prevention of disease. Personal hygiene relates to conduct of those aspects of life which the individual has under his immediate control—such matters as wise choice of food, wise use of exercise, adequate sleep, and maintenance of the bodily functions in normal activity. The larger matters pertaining to the maintenance of health and prevention of disease which demand co-operative effort on the part of the community, such as the provision of sufficient and wholesome water, efficient drainage, adequate housing, inspection of food, prevention and arrest of epidemics, etc., are part of public health, a sub-division of medicine of increasing importance.

Hygiene, LONDON SCHOOL OF. In full the London School of Hygiene and Tropical Medicine (University of London), this dates from 1921 when the Rockefeller foundation gave £454,500 to help its establishment. The building in Gower St. was formally opened by the prince of Wales in 1929. Bacteriology, biochemistry, and chemistry as applied to hygiene, entomology, medical statistics, para-

sitology, public health, applied physiology, and tropical medicine and hygiene are taught.

Hygrometer (Gr. *hygros*, damp; *metron*, measure). Instrument for measuring the amount of water vapour in the atmosphere. The commonest type of hygrometer consists of two thermometers placed side by side, the bulb of one being left dry, whilst that of the other is covered with fine muslin, kept constantly wet by a wick dipping into water. The water evaporates, and as some of the heat necessary to evaporate it is obtained from the thermometer, the temperature of the latter is lowered. Thus the wet bulb thermometer usually registers a lower temperature than the dry bulb thermometer. The difference between the two readings gives the means of obtaining the humidity of the air. The greater the difference between them, the smaller is the relative humidity. When the readings are the same the air is saturated, *i.e.* is holding its maximum amount of vapour.

For routine measurements at British and Empire meteorological stations the thermometers are usually mounted in a box with louvered sides, known as a Stevenson screen. Relative humidity, dewpoint temperature, vapour pressure, etc. can be calculated from suitable tables. To a certain extent, however, the evaporation from the muslin of a wet-bulb thermometer depends upon the rate of flow of air over the bulb. Hence, in order to obtain accurate measurements of humidity, it is necessary to maintain a definite rate of ventilation. This is achieved in the Assmann psychrometer with a clockwork or electrically driven fan which draws air over the thermometer bulbs, and in the "sling" psychrometer by whirling the thermometers in a frame.

A continuous record of relative humidity can be obtained by making use of the fact that human hair, uncontaminated and freed from natural oil, increases in length when placed in a damp atmosphere—the increase from dry to saturated air is approximately three p.c. In Richard's hair hygrometer a system of levers communicates the movements of a bundle of hairs to a pen which thus traces the variations in relative humidity upon a chart wound on a drum made to revolve by clockwork. Portable instruments, in which the movements of a single hair are communicated to a pointer, are widely used commercially,

e.g. to control air-conditioning apparatus in industrial processes.

In the electrical hygrometer due to Dunmore, two palladium wires are wound side by side on an insulating surface covering a metal tube. The intervening surface between the wires is coated with a thin film of lithium chloride solution mixed with a plastic binder. The resistance of this film changes with the degree of humidity owing to the hygroscopic nature of the lithium chloride. Since it depends upon electrical resistance, this device permits of automatic recording and it has been used, partly on account of its rapidity in action, to record humidities in the upper atmosphere. The apparatus is sent up in a radio-sonde balloon, and a small radio transmitter signals to the ground the indications of the recording instruments. A similar type of electrical hygrometer depends upon the alteration of the resistance of cotton threads when impregnated with certain hygroscopic salts.

In the chemical hygrometer, a known volume of air is aspirated slowly over tubes containing calcium chloride and the gain in weight of the tubes gives the actual mass of water vapour present in the known volume. This instrument is chiefly used for standardising other types. Another method of determining humidity lies in ascertaining the temperature at which dew will form on a polished surface whose temperature can be measured. During the Second Great War a very sensitive instrument of this type was designed by Dobson and Brewer (frost-point hygrometer) to provide information concerning the humidity of the lower stratosphere where, owing to the low temperatures, there is little water vapour to measure.

Hyksos. Loose confederation of West Asian desert peoples which dominated Egypt between the XII and XVIII dynasties. According to Josephus their rule lasted 511 years. Inaccurately called shepherd kings, their Greek name may represent the Egyptian hequshasu, princes of the Bedawin. Skilled archers, and bringing with them the horsed chariot, they established a defensive line from Ava Avaris, near Tanis; their camp at Tel el-Yehudiya was excavated in 1906. Modifying their nomadism, they assimilated the Egyptian culture, upon which they left little trace. By their expulsion Aahmes I, about 1580 B.C., inaugurated the new empire. *See* Nomad.

Hyllus. In Greek mythology the eldest son of Hercules and Deianeira. He and his brothers fell in an unsuccessful expedition from Athens to regain a footing in the Peloponnese, from which they had been expelled. Hyllus fell in single combat with Echemus, king of Arcadia.

Hylozoism (Gk. *hylē*, matter; *zōē*, life). Theory which attributes a primitive and inherent life to matter, and regards life as being nothing more than one of its properties. The name Hylozoists is sometimes given to the earliest Greek philosophers.

Hylton, JACK (b. 1892). British impresario. Born at Bolton, July 2, 1892, he became an accompanist to a concert party, a conductor of revues on tour, and a cinema organist before becoming a dance-band leader at the Piccadilly hotel and the Kit-Cat club. In 1924 he organized a dance band, pre-eminent in its class for the next 15 years. In 1940 Hylton took up management, and organized a music hall tour by the London Philharmonic Orchestra in that year. He later put on many straight and musical plays in London. The French government made him a member of the Legion of Honour and Officier de l'Instruction Publique.

Hymans, PAUL (1865-1941). A Belgian statesman. Born at Ixelles, Brussels, March 23, 1865, and educated at Brussels university, he was called to the bar in 1885. In 1895 he became professor of comparative parliamentary history at Brussels university. Entering parliament in 1900 as Liberal member for Brussels, he soon became leader of his party. When on Aug. 2, 1914, Germany demanded passage through Belgium for the German army, Hymans joined the government as minister without portfolio, and went to the U.S.A. to enlist the sympathy and support of President Wilson. In 1915 he was appointed Belgian minister in London, where he had to deal with the large influx of refugees. In 1917 he joined the Belgian government at Havre as minister of economic affairs, and at the end of the First Great War became foreign minister. He represented Belgium at the peace conference and was one of the signatories of the Versailles treaty. He also signed the League of Nations covenant, which he had helped to draft. In 1920 he was appointed Belgian representative to the League of Nations and presided over the first assembly at

Geneva. He was Belgian foreign minister 1924-25, 1927-1934, and again in 1935. He retired 1936, and died at Nice, March 8, 1941.

Hymen or **HYMENAEUS**. In Greek mythology, the god of marriage, son of Bacchus and Aphrodite or of Apollo and one of the Muses. He was always invoked at marriages, in a bridal song called Hymen. On the other hand the personality of Hymen may have been invented to explain the song. Hymen is represented as a youth, bearing a bridal torch. See Marriage.

Hymen. Membrane which partially closes the external opening of the vagina, the female genital passage. It is named after the Greek god of marriage. Its presence does not prove virginity, nor its absence loss of virginity.

Hymenomycetales. Extensive family of fungi. They are characterised by the spore-producing surface consisting of a hymenium or membrane spread over plates or gills (Agaricaceae), lining tubes or depressions (Polyporaceae), covering spines (Hydnaceae), or investing the greater portion of club-shaped or branching fungi (Clavariaceae). As in all the class Basidiomycetes, the spores are naked and borne in fours on the club-shaped terminal cell (basidium) of a thread (hypha), each spore being produced on a stalk (sterigma).

Hymenoptera (Gk. *hymen*, membrane; *pteron*, wing). A very large order of insects including the saw-flies, ichneumon flies, ants, bees, and wasps. More than 80,000 species are known and comprise minute to large insects having membranous wings with relatively few veins. The hind wings are the smaller and are linked with the fore pair by hooklets. A number of species, including worker ants, are wingless. The mouthparts are for biting and licking, a median tongue, or glossa, being present. The abdomen has its first segment merged into the thorax and a sawing or piercing ovipositor is present which, in bees, wasps, and some ants, is modified into a sting. The larvae are either caterpillars associated with plants, as in saw-flies (*q.v.*) or are legless grubs. In the ichneumon flies (*q.v.*) and their allies the larvae live as parasites of other insects, etc.; while in the ants and certain bees and wasps, which are social in habit, they are fed and tended by sterile individuals (workers). Over 6,000 species of Hymenoptera are found in Britain, contained in more than 1,000 genera. See Ant; Bee; Wasp, etc.

Hymettus. Mountain of Attica, ancient Greece, about 4 m. S. of Athens, now called Trelo Vouno. It is 3,360 ft. in height, and is celebrated for marble quarries and honey.

HYMN: AND WRITERS OF HYMNS

G. A. Leask, Author of *The Story of Our Hymns*

This article, which concludes with an account of hymn tunes, traces the development of the modern hymn from the early days of the Church. See Psalm; also the biographies of the leading hymn writers: Watts, Isaac; Wesley, Charles, etc.

A hymn (Gr. *hymnos*, a poem) is a song of adoration and thanksgiving to God, or a petition and confession. Hymns are usually associated with public worship, but many are suited for private devotion. The origin of the hymn can be traced to the ancient Hebrew psalm, and in scripture hymn and psalm are interchangeable.

EARLY HYMNS. Hymnody developed first in the Eastern Christian Church. The oldest Christian hymn whose authorship is known is Shepherd of Tender Youth, from the Greek, and is attributed to Clement of Alexandria (150-220), whose hymn for children in which Christ is referred to as Sure Helm of Babes, is well known.

Most modern hymnals contain translations of hymns from the Latin and Greek composed c. 100-700. The famous *Ter Sanctus*,

based on Isaiah 6, 3, familiar as Holy, holy, holy, Lord God Almighty, and the Gloria in Excelsis, based on the song of the angels at Bethlehem, belong to an early date, though they have been placed as late as the 5th century. Bishop Synesius (375-430), who wrote Lord Jesu, think of me, and Niceta, bishop of Dacia, are well-known names. Another early hymn is the famous O Gladsome Light, sung at the lighting of the lamps, and familiar in Keble's translation, Hail! Gladdening Light. The Te Deum, regarded as the greatest of all songs of praise, is placed towards the end of the 4th century, and usually ascribed to S. Ambrose (340-397), bishop of Milan, though some authorities date it later. S. Ambrose put Latin hymnody on the footing it held in the Western Church for many centuries. S

Hilary, bishop of Poitiers (d. 368), another great name in early hymnody, is overshadowed by S. Benedict of Nursia (d. 541), whose hymns became an established part of early English Church hymnody up to the middle of the 16th century. Venantius Fortunatus, bishop of Poitiers (d. 609), wrote about a dozen hymns, including *The Royal Banners forward go*. Later, the famous *Come, Holy Ghost, our souls inspire*, attributed to Charles the Great (d. 814), and to his grandson Charles the Bald, enjoyed wide popularity. All glory, laud, and honour, by Theodulphus (d. 821), is second only to the *Te Deum*.

MEDIEVAL HYMNS. These are largely concerned with mysticism and inward searching of the heart. Among their writers Notker Balbulus (840-912), of the Benedictine monastery of S. Gall, is a leading name, but the greatest medieval hymn writer is S. Bernard of Cluny (not to be confused with his namesake of Clairvaux), who wrote *Hora Novissima*, a poem on the subject of the last part of the Book of the Revelation.

S. Bernard of Clairvaux

S. Bernard of Clairvaux composed hymns which are the heritage of the whole Church (Jesu, the very thought of Thee; Jesu, Thou joy of loving hearts). Brief life is here our portion; For thee, O dear, dear country; and Jerusalem the Golden are Dr. J. M. Neale's versions of hymns by Bernard of Cluny (12th century). A famous composition of the 13th century is *Dies irae, dies illa* (That day of wrath, that dreadful day), a Latin hymn of the Day of Judgement generally attributed to Thomas of Celano.

MODERN HYMNODY. Martin Luther gave the German people the first Protestant hymn-book. Though a translator of Latin hymns, he wrote original sacred verse, including *A Mighty Fortress is our God*, the "*Marseillaise*" of the Reformation." Next to Luther in importance is Paul Gerhardt, whose most familiar hymn is *Give to the winds thy fears*. Hymnology owes much to the German school, and the leading names, in addition to the above, are: Nikolaus Selnecker, Herman and Hans Sachs, Ringwaldt, Rinckhart, Dessler, Hiller, Arnold, and Zinzendorf. Rinckhart's famous hymn is familiar to us through the version of Catherine Winkworth (1827-78), beginning *Now thank we all our God*. Something every heart is loving is Mrs. Bevan's translation of Tersteegen's *Jedes Herz will*

etwas lieben. Count Zinzendorf wrote over 2,000 hymns.

ENGLISH HYMNODY. In England Latin hymns held the field until the Reformation. The evolution of the English hymn can be traced from the metrical psalms and paraphrases used in public worship. From 1516 to 1696 the authorised book of the Church of England was the Old Version of Sternhold and Hopkins, and from the latter date to the adoption of the modern hymnal the New Version of Tate and Brady. Coverdale had attempted translations of hymns from the German, and Cranmer and Hilsey from the Latin, but these were not a success.

Sacred Verse of the 17th Century

Some of the finest hymns find no place in English church hymnals, not being intended for congregational singing, e.g. Milton's *Ode on the Morning of Christ's Nativity*; Walter Scott's *When Israel of the Lord beloved Out of the Land of bondage came*. In the 17th century was produced sacred verse full of quaint conceits, artificial and metaphysical in form and phraseology. George Wither (1588-1667) was creator of the hymn-book entitled *The Hymns and Songs of the Church*. He aimed at providing a hymn for every occasion. Francis Quarles wrote a large number of religious verses the best being his *Emblems*; Robert Herrick wrote many sacred pieces; William Barton was the author of *Six Centuries of Select Hymns and Spiritual Songs*. His hymns are chiefly paraphrases of the Bible narrative. George Herbert (1593-1633) was a noted hymn writer of this period.

Present-day hymnody arose in the 18th century, the great names of which are Charles Wesley, Isaac Watts, Doddridge, Cowper, Newton and Toplady. John Wesley compiled the first real hymn-book for use in the Church of England, made by him during his mission in Georgia, U.S.A. His brother, Charles, wrote over a thousand hymns. Even today all hymnals contain a number of his best pieces, chief of which is the beautiful *Jesu, Lover of my Soul*. Augustus Toplady (1740-78) is the author of the companion classic *Rock of Ages*. Cowper wrote the favourite *God moves in a mysterious way*; Hark, my soul, it is the Lord; There is a fountain filled with blood, and published with John Newton (1725-1807), the fervent *Olney Hymns* (1779). Isaac Watts is claimed by many as the "inventor" of the English hymn.

What may be said is that Watts made it representative of the aspirations of the majority of Christian people and Charles Wesley developed the hymn as the expression of the individual soul's particular needs.

During the 19th century hymns became more literary in expression, chiefly through the influence of Bishop Heber (1783-1826). Edward Bickersteth's *Christian Psalmody* was followed by the *Hymnal Companion* (1870-76) by his son, Bishop E. H. Bickersteth. An important landmark was the appearance of the famous *Hymns Ancient and Modern*, first issued in 1860-61, with supplements in 1889 and 1916. It was edited by Sir W. W. Baker (1821-77), who himself contributed many translations and hymns, e.g. *The King of Love my Shepherd is*. Ten years later appeared *Church Hymns*, published by the S.P.C.K., which had nearly as important an influence. In 1906 appeared the *English Hymnal*, containing hymns written by contemporary authors, e.g. Chesterton and Kipling, as well as the historic ones. This was followed in 1925 by *Songs of Praise*, edited by Dr. Percy Dearmer. The free churches mostly have their own collections of hymns, as do certain colleges, cathedrals, and parish churches. Mention should also be made of the popular "sacred songs" introduced by the American Evangelists Moody and Sankey. The Salvation Army uses the simplest possible hymns set to popular or topical tunes.

Famous Hymn Writers

The more important hymn writers of the 19th and 20th centuries may be briefly indicated as follows:

James Montgomery (1771-1854), *Hail to the Lord's anointed*; Harriet Auber (1773-1862), *Our blest Redeemer, ere He breath'd*; Sir Robert Grant (1785-1838), *O worship the King*; Charlotte Elliott (1789-1871), *Just as I am, without one plea*; Henry Hart Milman (1791-1868), *When our heads are bow'd with woe*; John Keble (1792-1866), *Sun of my soul, Thou Saviour dear, and New every morning is the love*; H. F. Lyte (1793-1847), *Abide with me*; John Henry Newman (1801-90), *Lead, kindly Light, and Praise to the Holiest in the height*; Sarah Adams (1805-48), *Nearer, my God, to Thee*; Horatius Bonar (1808-89), *When the weary seeking rest, A few more years shall roll, and I heard the voice of Jesus say*; Dean Alford (1810-71), *Forward be our watchword, and Ten thousand times ten thousand*; Jemima Luke (1813-1906), *I think when I read that sweet story of old*; F. W. Faber

(1814-63), Souls of men, why will ye scatter; Cecil Frances Alexander (1823-95), Once in royal David's city, There is a green hill far away, and many other children's hymns; E. H. Bickersteth (1825-1906), Peace, perfect peace; Albert Midlane (1825-1909), There's a Friend for little children; John Ellerton (1826-93), Saviour, again to Thy dear Name we raise, and The day Thou gavest, Lord, is ended; S. Baring-Gould (1834-1924), Onward, Christian soldiers, and Through the night of doubt and sorrow; F. R. Havergal (1836-79), Golden harps are sounding, Who is on the Lord's side, and Take my life and let it be; W. C. Dix (1837-98), Come unto Me, ye weary, and As with gladness men of old; George Matheson (1842-1906), O Love that wilt not let me go; Katherine Hankey, Tell me the old, old story; Bishop Heber (1783-1826), From Greenland's icy mountains; Canon Twells (1823-1900), At even ere the sun was set; Archbishop MacLagan (1826-1910), The saints of God! their conflict past; Fanny Crosby (Mrs. Alstyne) (1823-1915), Rescue the perishing, and Safe in the arms of Jesus; Hugh Stowell (1799-1865), Jesus is our shepherd; Elizabeth C. Clephane (1830-69), There were ninety and nine; Bishop Walsham How (1823-97), For All the Saints; Edward Hayes Plumtre (1821-91), Thy Hand, O God, has guided. Hymns by Sir Henry Newbolt, A. C. Benson, Robert Bridges, and others are included in various hymnals.

Bibliography. Many meritorious works on hymnology have appeared, the more important including Hymns, their history and development, Sir R. Palmer (Lord Selborne), 1892; Dictionary of Hymnology, J. Julian, rev. ed. 1907; Studies of Familiar Hymns, L. F. Benson, 1908; Early Christian Hymns, D. J. Donahoe, 1908-11.

HYMN-TUNE. This is a melody to which the recurring stanzas of a hymn are sung. Hymn singing, as distinguished from psalm singing, began in the 4th century. The use of metrical hymns in Latin inspired the composition of accompanying tunes, many of which are extant. They were, of course, unharmonised, but in 1589 Palestrina published his *Hymni Totius Anni*, with the tunes treated in polyphonic style for three, four, five, and six voices, which gave a great impetus to the practice of singing hymns. At the Reformation Luther, himself a skilled musician, perceived the attractive power of music over the people, and through the efforts of the reformers a large number of *Choräle* were written, which became a part of the very life of the Germans. In Switzerland, France, and England equal zeal was manifested. Metrical versions of the psalms became popular in this

country, and psalters (*q.v.*) were published with suitable tunes.

The revival movement of the Wesleys and Whitefield derived much of its force from the singing of hymns, which these evangelists supplied in vast numbers, utilising for the most part familiar tunes. In the 19th century hymn singing became more than ever a popular part of congregational worship, and many hymnals and tune books were brought out, by far the most popular being *Hymns Ancient and Modern*, 1860-61. As the authors of new hymns tended to use other than the common and long metres, new tunes were necessary, and were supplied by such composers as Gauntlett, Barnby, Dykes, Sullivan, Stainer, Smart, Steggall, S. S. Wesley, and Hopkins, and, later, Martin Shaw, Holst, and Vaughan Williams.

Hymn of Hate. German ballad produced in the First Great War. It was written in the autumn of 1914 by a minor German poet, Ernst Lissauer, who was a private in the Prussian army and of Jewish origin. It became the rage of the day, and its author was awarded the Iron Cross. Typical lines translated,

We have all but a single hate,
We love as one, we hate as one,
We have one foe, and one alone—
England!

It was paralleled to some extent in the Second Great War by a similar song, *We march (sail) against England*.

Hyndman, HENRY MAYERS (1842-1921) A British socialist. Born in London, March 7, 1842, and educated at Trinity College, Cambridge, he began life as a journalist, being correspondent for *The Pall Mall Gazette* in the Austro-Prussian War of 1866, and on the staff of *The Melbourne Argus* in 1869. Becoming a convert to the revolutionary socialism

of Marx, he founded the Social Democratic Federation in 1881.

Hyndman contested Burnley as a Socialist three times without success. His publications included *Indian Policy* and *English Justice*, 1874; *Historical Basis of Socialism*, 1883; *The Record of an Adventurous Life*, 1911; *The Evolution of Revolution*, 1920. He died Nov. 22, 1921. *Consult* Hyndman, Prophet of Socialism, F. J. Gould, 1928.

Hyne, CHARLES JOHN CUTCLIFFE WRIGHT (1865-1944). A British novelist. Born at Bibury, Glos., May 11 1865, and educated at Bradford grammar school and Clare College, Cambridge, he travelled widely, mainly in the little ships whose officers he grew to know so



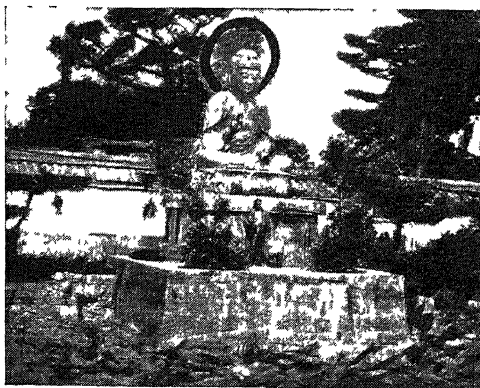
C. J. Cutcliffe Hyne,
British novelist
Elliott & Fry

well and portrayed so vividly in his books. The little red-headed Captain Kettle, a secondary character in *Honour of Thieves*, which was serialised in *Answers* in 1895, became the central figure of a series of adventure stories appearing over forty years, illustrated in *Pearson's Magazine* by Stanley L. Wood. In a different vein, he wrote *Recipe for Diamonds*, 1894; *The Lost Continent*, a tale of prehistory, 1900; and *Don't You Agree?*, putting forward his political views, 1936; *Wishing Smith*, 1938, and many others. He died March 10, 1944.

Hyogo. Part of the port of Kobe, Honshu, Japan. In the 12th century Hyogo was the Japanese capital for a short period; a harbour was later made and became one of the great marts, and in the

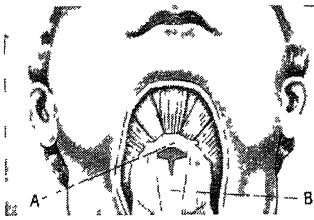
18th century nearly 800 vessels belonged to the port. In 1867 a few fishing villages occupied the area E. of Hyogo, and there the port of Kobe was established as a treaty port which absorbed Hyogo in 1886. *See* Kobe.

Hyoid Bone (*Gr. hyooides*). In human beings, a U-shaped bone situated at the base of the tongue.



Hyogo, Japan. The bronze image of Buddha in the Shinkoji gardens

It may be felt immediately below the chin, and serves to give attachment to some of the muscles which



Hyoid Bone. Base of the tongue showing, A, hyoid bone and, B, larynx

move the lower jaw and tongue. See Hyostyly; Tongue.

Hyoscyamine. Alkaloid contained in henbane (*Hyoscyamus niger*), in belladonna (*Atropa belladonna*), and in stramonium (*Datura stramonium*). It is usually associated with atropine, and is readily converted into the latter by heat. A trace of hyoscyamine applied to the eye produces dilatation of the pupil. The alkaloid is a poison. For a similar alkaloid known as hyoscine, see Henbane.

Hyoscyamus Extract. An extract from the leaves of henbane (*Hyoscyamus niger*). It is employed in medicine as a nerve sedative and in the relief of spasm.

Hyostyly. Term in anatomy. The upper jaw in the vertebrate skull is formed of elements which are separate from those enclosing the brain, and which are probably derived from skeletal elements belonging to the sets which support the series of gill-bars. The upper jaw, derived in this way, may be attached to the brain-case in a number of different ways. If it is attached by the intervention of an upper element of the next more posterior set of gill-bar elements—called the hyoid set—the fish (shark or dogfish) in which this condition is found is said to exhibit hyostyly, or hyostylic suspension of the jaw. In higher forms this method of jaw-suspension is lost.

Hypanthium OR **HYPANTHODIUM.** In botany, the fleshy, enlarged hollow end of the peduncle which supports certain flowers, such as that of the apple, myrtle, etc. In the fig it has developed so as to enclose flowers and seeds.

Hypatia (c. 370–415). Daughter of the mathematician Theon of Alexandria. Lecturer on neo-Platonism and author of mathematical works, she was done to death by the people on suspicion of having incited the Roman governor of Egypt to persecute the Christians. Charles Kingsley used her life as the basis for his novel Hypatia.

Hyperbola (Gr. *hyper*, beyond; *ballein*, to throw). One of the sections of the cone. It is defined mathematically as the locus of a point which moves so that its distance from a fixed point, the focus, bears a constant ratio which is greater than unity to its distance from a fixed straight line called the directrix. See Conic Sections.

Hyperbolē (Gr. *hyper*, beyond; *ballein*, to throw). In rhetoric, a figure that expresses more than is warranted by the facts. Thus it implies exaggeration, as in expressions of admiration, fear, hatred; it may be used when it is desired to make things more intelligible as well as more impressive; or may be resorted to for comic effect. It calls for imagination, appreciation of the audience or the reader, and, to be effective, must possess a higher quality than mere exaggeration. Milton's lines in *Paradise Lost*, ii, 719:

So frowned the mighty combatants, that hell
Grew darker at their frown

is a good example. Dryden's couplet on Charles II, in *Astraea Redux*:

That star that at your birth shone out so bright,
It stained the duller sun's meridian light

is an example of fulsome adulation. An example of the comic effect of hyperbolē is in Voltaire's remark that the English gained two hours a day by clipping words. See Rhetoric.

Hyperbolic Functions. Functions having relations to a rectangular hyperbola similar to that of the ordinary trigonometrical functions sine, cosine, tangent, etc., to a circle. The functions are written \sinh , \cosh , \tanh . See Calculus; Trigonometry.

Hyperboloid. Name given to solids the surfaces of which are such that, if cut by three planes mutually at right angles, two of the sections are hyperbolas and the third is an ellipse.

Hyperbolus (d. 411 B.C.). Athenian demagogue. Of humble origin, he made a fortune as a lamp-seller, and after the death of the rival demagogue, Cleon, gained such a hold over the populace that he was even appointed commander-in-chief. Like Cleon, he was the butt of the comic poets. His attacks upon Nicias and other prominent Athenians and his dishonest practices led to his banishment to the island of Samos, where he was slain during an oligarchical rising.

Hyperborei. In Greek mythology, a nation which was supposed to dwell beyond (*hyper*) Boreas,

the north wind. They dwelt in the utmost peace and happiness in a land of perpetual sunshine with soil of amazing fertility, and lived to a fabulous old age.

Hypercalcaemia (Gr. *hyper*; Lat. *calx*, lime). Condition in which too great a proportion of calcium, withdrawn from bones thus rendered brittle, circulates in the blood. It is due to a lesion of the parathyroid glands (four small glands lying two on either side of the thyroid gland in the neck) which control the calcium-phosphorous chemistry of the body. Pain and tenderness of the bones, frequently accompanied by spontaneous fracture, are the outstanding symptoms, together with wasting and loss of appetite. If X-ray therapy fails, treatment consists in the removal of three out of the four parathyroids.

Hyperglycaemia (Gr. *hyper*, excessive; *glykys*, sweet). Condition in which the bloodstream contains too high a proportion of sugar. It occurs in *diabetes mellitus*, and is also associated with oxygen shortage at high altitudes. Too much sugar in the blood is a poison, producing coma, which can be relieved by insulin. See Diabetes; Hypoglycaemia.

Hypericaceae. A family of herbs, shrubs, and trees. They are natives of the temperate regions, and the mountains of warm regions. They have opposite leaves, often with pellucid glands which give the appearance of minute perforations. The flowers are in clusters at the ends of shoots, and their parts are usually in fives (rarely fours). The fruit is a capsule or a berry containing numerous seeds. They have properties as purgatives, astringents, and tonics. The *S. John's-worts* (*Hypericum*) form the typical genus.

Hyperides OR **HYPEREIDES** (c. 390–322 B.C.). An Attic orator. A supporter of Demosthenes in his anti-Macedonian policy, Hyperides was actively associated with the revolt against Antipater, the successor of Alexander the Great. His hopes were destroyed at the disastrous defeat of Crannon (322 B.C.), and he was shortly afterwards murdered by the agents of Antipater. His oratory was graceful and polished rather than vigorous. All his speeches were lost for centuries, but considerable fragments have been recovered, including one almost complete speech. This is *For Euxenippus*, which is the chief authority on the *eisangelia* or impeachment or state prosecution of officials of Athens.

Hyperidrosis. Excessive activity of the sweat glands. This may be general, or localised to the axillae, the palms of the hands, or the soles of the feet. General sweating in excess is a symptom of toxic invasion such as obtains in phthisis or typhoid fever, and characterises certain disorders of the nervous system. The underlying disease must be treated and general hygienic measures taken. Troublesome localised sweating may be treated with X-rays, measures to adjust the glandular balance of the sufferer, and disinfection of the sodden skin with spirit, mercurial, and other lotions to protect it from the invasion of bacteria, and the resulting smell.

Hyperion. In Greek mythology one of the Titans. He was the father of Helios, the sun, Selēnē, the moon, and Eos, goddess of the dawn. Hyperion is often confounded with Helios. *See* Titan.

Hyperion. Satellite of Saturn, discovered by Bond in 1848. Seventh in order from the planet, it is eighth in brightness, being only about 250 m. in diameter. It circulates at a mean distance of 922,000 m. from the planet in a period of 21 days 6½ hours.

Hyperion. Uncompleted poem by John Keats, first published in 1820. It was presumably intended to be a blank verse epic, but only the first two books—357 and 391 lines respectively—and 135 lines of the third were written. The theme is the overthrow of Saturn and the Titans by Jupiter.

Hypermetropia. Long sight, the condition in which parallel rays of light do not converge to a focus upon the retina, but tend to be brought to a focus behind that membrane. The condition occurs when the eyeball is too short or the cornea too much flattened. It can be corrected by the use of convex glasses. *See* Eye; Vision.

Hyperpiesis or **HYPERTENSION.** High blood pressure. It is doubtful whether this condition becomes more common with the increasing stress of civilization or whether the sphygmomanometer enables it to be more frequently and accurately diagnosed. It is extremely difficult to judge of its presence or degree without such an instrument; the nature of the pulse, or a particular accentuation of the heart sounds, being fallible guides. Apparently the liver elaborates some antipressor substance which holds in check a pressor substance elaborated by the kidneys. When the former fails the whole arterial bed of the

body narrows, and in due course the heart enlarges to battle against the narrowed tubes and the resulting raised pressure in them.

When the condition is accentuated, headache, undue fatigue, and kidney damage may supervene. There is always the risk of a stroke caused by a cerebral vessel giving way before the increased tension. If the victim of high blood pressure is young, it may be possible to decide whether one of the kidneys is at fault. In older subjects, rest and freedom from worry offer the best prospects. The sufferer from over-high blood pressure should avoid any occupation involving stooping, *e.g.* gardening. Drugs must be used with caution. *See* Hypopiesis.

Hypersthene. Rock-forming mineral, one of the orthorhombic pyroxenes. It is an iron magnesium silicate with more than 15 p.c. of the iron molecule, and grades into the iron silicate enstatite. Good crystals are rare, and hypersthene generally occurs as dark brown to greenish-black grains and masses in basic igneous rocks (norite, gabbro, etc.); in intermediate igneous rocks (andesite, etc.); in metamorphic rocks (charnockite, various crystalline schists and hornfelses). Hypersthene can be cut and used as a gem-stone.

Hypertrophy. In medicine, enlargement of an organ or tissue beyond its normal size. Usually, this occurs in response to an increased demand made upon the organ or tissue; for instance, if one of the kidneys is removed the remaining kidney enlarges in order to take on increased responsibility. Similarly, the heart of the athlete enlarges in response to the increased demand upon the circulation resulting from abnormal muscular activity. Hypertrophy of an organ, *e.g.* the breast or tongue, sometimes occurs as a pathological process. Increase in the size of an organ is no guide to its functioning capacity, for the increase in size may be due to the presence of a greater number of structural cells and not to an increase of actively functioning cells.

Hypha. One of the thread-like units of which the vegetative body or mycelium (*q.v.*) of most fungi consists. When the spore of a fungus germinates it usually puts out a delicate, tubular, germ tube. This grows longer to become the first hypha, and it commonly branches many times to produce a spreading system of hyphae which is the mycelium. Hyphae are bounded by non-living walls within which cytoplasm, nuclei, and

vacuoles occur. In Phycomycetes (*q.v.*) they are normally coenocytic, *i.e.* without septa. In the higher fungi—Ascomycetes and Basidiomycetes—septa occur at intervals so that each hypha consists of a row of cylindrical “cells,” in which one, two, or more nuclei are found according to type.

Hyphen (Gr. *huph*=*hypo*, under; *hen*, one). Name given to a short line, indicating the union of two words so as to form one compound, *e.g.* three-pronged. It is also used to show the connexion between two syllables of a divided word at the end of a line, or as an etymological guide to show the component parts of a word, *e.g.* in-ad-miss-ible. Hyphenated surnames, usually the result of marriage or adopted for convenience when a name is as common as Smith or Jones are rightly or wrongly considered in the U.K. a mark of social superiority.

Hypnotic (Gr. *hypnos*, sleep). Substance used to induce sleep. Among such substances are opium and its derivatives, which act by their power to negate pain; and the barbiturates, such as chloral and veronal, which act by direct effect on the sleep centre of the brain. They must be used with discretion and under the direct control of a physician, for a habit easily establishes itself. Barbiturates also spoil mental concentration, memory, and initiative if their use is continued over long periods. *See* Insomnia.

Hypnotism (Gr. *hypnos*, sleep). Artificial induction of a state, resembling sleep, the subject being specially open to suggestion. The degree of control possible depends upon the depth of the hypnosis, the personality of the subject, and the method used to induce the hypnotic state. In light hypnosis the patient may be aware of his surroundings, but is unable to move any muscle which he is told he cannot move. This is followed by a state (also found in catalepsy) when the limbs may be placed in any anatomically possible position and will remain there completely inert. In some cases anaesthesia occurs. When deep hypnosis is reached the subject seems to be asleep; after waking he remembers nothing of what took place unless ordered to do so, while he was in a state of hypnosis, and up to a point he will act and perceive as he is told. For example he will “see” objects which are not present, remain blind to those which are, run on all fours like a dog if he is told that he is a dog, etc. In some

subjects it is possible to produce bodily changes—e.g. of temperature—which are beyond their normal control. Forgotten events may be recalled, especially those of early childhood, and with them the emotions experienced at the time. Perhaps the most striking of these phenomena is that orders given during deep hypnosis will be carried out at the time suggested after the subject has awakened—the longest interval vouched for being a year.

Methods of Inducing Hypnosis

The methods used to induce hypnosis vary. The subject is made comfortable, asked to relax, and as a rule told to fix his eyes upon some bright object above eye-level in order to fatigue the muscles of the eye, which of itself creates a desire to sleep. In order that this may not be merely normal sleep the operator keeps in touch with him by a stream of suggestions—telling him that his limbs are growing heavy, that he feels drowsy, etc. Light rhythmical stroking of the limbs is also helpful. When the right moment arrives the subject is told that he cannot make some particular movement. Should he try and prove unsuccessful, hypnosis has been achieved. The hypnotist can adopt either a commanding attitude or one which asks for willing consent. The former may rouse resentment in normal persons, and this fact has led to the erroneous belief that only neurotics and invalids can be hypnotised. On the contrary, many doctors find that healthy outdoor types are easier to influence than nervous people. Nor does the control gained by domineering methods seem to last so long as that achieved by friendly approach.

It is not possible, apparently, to hypnotise anyone wholly against his will; but far less cooperation is needed in mass hypnosis than when dealing with an individual. Nor can the subject be compelled to perform actions which are deeply repugnant to him. A man who will strike an onlooker with a cardboard dagger will wake when a real weapon is put into his hand; most people wake when told to do something humiliating. But should a patient possess a strong, unconscious desire barely kept in check in ordinary life to perform a suggested action, then the order of the hypnotist may tip the scales. For this reason precautions must be taken before dangerous suggestions are made; and unqualified persons should not experiment, therefore, with hypnotism.

The hypnotist's orders begin to lose their force when the patient is no longer in touch with him, and hypnotism, therefore, finds less favour than it did with psychoanalysts. It can be used to get rid of hysterical symptoms; but unless the neurosis causing the hysteria is dealt with, other and perhaps more burdensome symptoms may replace those banished. Surgical operations have been successfully performed upon hypnotised patients; and though some patients cannot be placed under deep hypnosis, it is increasingly used in medicine as an anaesthetic, particularly in obstetrics. It explains many cures wrought by faith-healers. *Consult* Medical and Psychological Research, W. T. Mitchell, 1925; *An Outline of Abnormal Psychology*, W. McDougall, 1926; *Man, Morals, and Society*, J. C. Flugel, 1945.

Hypnum. Genus of mosses of the order Bryales and of the section Pleurocarpi. In them the spore capsules are produced from the sides of the stems and branches. The very numerous species are known familiarly as feather-mosses, which well describes the branching, trailing growths of many forms. They grow on the trunks and roots of trees, rocks, old walls, and moist banks in all parts of the world. The capsules are nodding, more or less curved or irregular, and the teeth (peristome) guarding the mouth are in a double series.

Hypo. Name commonly used for sodium thiosulphate ($\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$), incorrectly referred to as sodium hyposulphite. *See* Photography; Thiosulphuric Acid.

Hypocaust (Gr. *hypo*, under; *kaiein*, to burn). Shallow heating chamber or channel beneath baths and dwelling-rooms, much used in Roman Britain. Invented by Sergius Orata (c. 100 B.C.), and used in Italy mainly for public baths, the system was, because of the colder climate, widely applied to Romano-British houses.

From an external furnace (*hypocaustis*) the hot gases, in the simplest type, passed through a channel to a wall flue, usually of box tiles. In a second type they passed to a central hollow whence branches led to flues in the sides and angles of the walls, as at Silchester. The most frequent type, as at Caerwent, was a chamber beneath the living-room, supported by rows of pillars about 30 ins. high and 18 ins. apart, often bearing mosaic pavements, as for example, at Woodchester, Gloucestershire, and Brading, I.O.W.

Hypochlorite. Compound of hypochlorous acid. Hypochlorites are characterised by their instability, chlorides and chlorates being formed when solutions are boiled. Calcium hypochlorite, formed when bleaching powder is dissolved in water, is the most important hypochlorite, and is much used as a bleach.

Hypochlorous Acid (HClO). Acid formed when dichlorine monoxide (Cl_2O) is dissolved in water. It is not known in the pure state. The solution can be prepared by shaking chlorine water with mercuric oxide, when the oxide dissolves and the solution clears. The liquid is then distilled to separate the hypochlorous acid from the mercuric chloride which was formed. Hypochlorous acid is a powerful bleaching agent, e.g. applied to ink-stains, it immediately removes them, and if the material is afterwards washed no corrosion results.

Hypochondriasis. The morbid anxiety of a person as to the state of his health. It is derived from *hypochondrium*, the part of the abdomen in which is situated the spleen, since this organ was formerly believed to be the seat of the disorder. Sufferers fear that they are afflicted with, or are specially vulnerable to, some disease. An attack of indigestion convinces them that they have cancer of the stomach, or a cough that they have tuberculosis. The condition is a neurosis, and treatment consists in ascertaining, by psycho-analysis or other appropriate methods, the underlying condition giving rise to the affection. In some cases hypochondriasis is a symptom of serious mental imbalance.

Hypodermic Injections (Gr. *hypo*, under; *dermos*, skin). Solutions of drugs injected under the skin by means of a hypodermic syringe (i.e. one fitted with a hollow needle). Intravenous injections are run into a vein; intramuscular injections are directed into a muscle. Such injections find their way rapidly to all parts of the body and this method of administration is therefore indicated when rapidity of action is desirable, where swallowing is difficult, or absorption from the gut impeded. Substances which are altered by the secretions of the intestine are also given by this effective method.

Hypogene (Gr. *hypo*, under; *-genes*, born). Name given to ore deposits which have been formed by ascending waters. Such waters, called hypogene waters, carry mineral-forming ingredients which are unloaded whenever the ascending

solutions encounter conditions favourable to deposition. See Ore Deposits; Supergene.

Hypogeum (Gr. *hypogaios*, underground). An underground chamber designed for occupation, refuge, storage, or burial. Ancient classical writers used the term of vaulted cellars in dwellings, temple treasuries, mines, and tombs. Many inhabitants retired to their hypogea during the eruption which destroyed Pompeii in A.D. 79. Archaeologists restrict the term to sepulchral chambers. They may be (1) earth-dug, e.g. the Neolithic grottoes of the Marne, the Homeric graves of the Troad, and numerous examples in S.E. Russia; (2) rock-cut, e.g. the Syracusan quarries, the Roman catacombs, the great Maltese hypogeum of Halsafieni, and Han sepulchres in Szechwan; (3) masonry, as in Mycenae, Lycia, and some Roman columbaria. They were sometimes richly adorned with paintings, as in Egypt, Cervetri in Etruria, and Marissa in Palestine; sometimes with external decorations, as at Petra in Arabia.

Hypoglossal Nerve (Gr. *hypo*, under; *glōssa*, tongue). Nerve passing out from the brain through a small aperture in the base of the skull. It takes a curved course downwards and forwards to the tongue, and gives off branches supplying the tongue and its immediate muscles.

Hypoglycaemia (Gr. *hypo*, under; *glykys*, sweet). Condition in which the blood stream contains too low a proportion of sugar. It is most often associated with overdosage of insulin combined with wrong food-intake in the diabetic patient. Symptoms vary from tremor, sweating, and malaise, to deep coma, and are relieved by sugar intake. Medicine recognizes an idiosyncratic hypoglycaemia associated with fatigue and depression, the cause being unknown. Hypoglycaemia is also sometimes intentionally induced by injections of insulin in cases where patients, otherwise physically normal, will not eat, owing to some neurosis; the lowering of sugar content in their blood causes an irresistible craving for sugar, which induces them to eat, e.g., suet pudding with golden syrup.

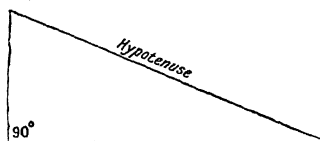
Hypophosphorous Acid. As used in commerce, a clear liquid containing 30 p.c. of the pure acid (H_3PO_2). It is best prepared by dissolving barium hypophosphite in water and adding dilute sulphuric acid until turbidity ceases. The liquid is then filtered

from the precipitate. It is used in the manufacture of iron hypophosphite, from which other hypophosphites used in medicine are made.

Hypopiesis OR **HYPOTENSION**. Low blood pressure. This condition, like its opposite, becomes increasingly recognized, if not increasingly common, through routine use of the sphygmomanometer. The systolic pressure falls far below the rough average (the age of the patient plus 100 less 5 p.c.) and results in undue fatigue, dizziness, etc. The condition has a hereditary suggestion and is resistant to cure. Sepsis must be sought out and removed; short, sharp, frequent exercise stimulates the circulation, and thereby the removal of waste products which cause lassitude of mind and body; strychnine, alcohol, coffee, and all stimulant substances are valuable.

Hypostasis (Gr. *hypo*, under; *stasis*, standing, substance). In theology, the hypostatic form is the essential constitution of each of the three persons of the Trinity; the hypostatic union is the union of the two natures in Christ. According to the neo-Platonists, God appears in three states or hypostases: unity, intelligence, soul. See God.

Hypotenuse (Gr. *hypo*, under; *teinein*, to extend). Side of a right-angled triangle opposite the right



Hypotenuse. Diagram showing the hypotenuse in a right-angled triangle, opposite the angle of ninety degrees

angle. By Euclid's 47th proposition, known as the theorem of Pythagoras, the square on the hypotenuse is equal to the sum of the squares on the other sides of the triangle.

Hypothee. In Scots law, a right of security enjoyed by a creditor for a debt due to him, the property covered by the security not being in the possession of the creditor. The landlord's right, when rent is due, to seize furniture and other chattels on the premises let is an example of hypothee. Hypothee is distinguished from a lien, which is a right to retain property already in the creditor's possession.

Hypothermal Deposits (Gr. *hypo*, under; *thermos*, warm). Geological term used in the classification of ore deposits (after Lindgren). The large group of ore deposits genetically related to igneous rocks has been subdivided according to mineral assemblages and geo-

logical associations. The hypothermal deposits form one member of the hydrothermal series, and are considered to have been formed from ascending thermal solutions at a relatively great distance below the surface, where the temperature was high (say 300–500° C.) and the pressure was very great. Examples of hypothermal deposits are to be found in certain gold-quartz veins (as in Ontario, South Dakota, Western Australia, etc.); in copper-tourmaline veins (Braden, Chile); and in lead-silver-zinc deposits (Broken Hill, New South Wales, and the Sullivan Mine, British Columbia).

Hypothermal deposits are generally associated with plutonic rocks such as granite, granodiorite, and diorite. The deposits are characterized by a massive texture and considerable wall-rock alteration and replacement; they often occupy shear-zones and the veins may be very persistent and regular. Metals in them may include tin, tungsten, molybdenum, gold, copper, lead, and zinc; while the common gangue minerals are quartz, tourmaline, chlorite, topaz, garnet, spinel, and sometimes amphibole and pyroxene. See Hydrothermal Deposits; Ore Deposits.

Hypothesis (Gr. *hypo*, under; *thesis*, placing). A word meaning supposition. Its simplest form is the hypothetical judgement (if A is, B is), in which the validity of the conclusion depends upon that of the major premise. In the narrower sense, an hypothesis is a general assumption, the provisional acceptance of a law, the existence of which cannot at the moment be proved, in order to account for a natural phenomenon. See Logic.

Hypsipylē. In Greek mythology, daughter of Thoas, king of Lemnos. Aphrodite, finding her altars in Lemnos neglected, avenged herself by making the Lemnian women offensive to their husbands, with the result that the husbands neglected them for Thracian slaves. Enraged at this neglect, the Lemnian women resolved to kill all the males in the island, Hypsipylē alone refusing to kill her father. Pron. Hip-sippi-lee.

Hypsometer (Greek *hypsos*, height; *metron*, measure). Apparatus for measuring the temperature at which water boils, in which case it is taken that the thermometer bulb is clear of the water surface but as much of the stem as possible is heated directly by the steam. As the pressure of the air affects the temperature at which water boils, it follows that a determination of the boiling point of water indicates

precisely the atmospheric pressure. Travellers and explorers therefore use a hypsometer to check their readings of an aneroid barometer. From the records of the pressure changes which occur during the ascent of a mountain, travellers estimate the heights above sea level of the places where the barometer or hypsometer was read.

Hypsometers have been used for calculation of the variations in the force of gravity at sea. The hypsometer gives a reading from which the air pressure or height of the barometer can be calculated. The mercury barometer gives the pressure directly, and the two readings should be equal. Since the latter is affected by gravity, and the hypsometer is not, there is a difference due to gravity.

Hypsometry is the art of measuring heights on the earth's surface. Such heights are measured by means of trigonometrical survey, by running a series of levels starting from mean sea level and ending at the point whose height is to be measured, and by readings of the barometer. The latter method is approximate only.

Hyracotherium (Gr. *hyrax*, mouse; *thērion*, small wild beast). Extinct four-toed ungulate mammal, an early ancestor of the horse (*q.v.*). The size of a fox, it was related to Eohippus. Remains are found in the lower Eocene deposits of Europe and N. America.

Hyrax. Group of small ungulate mammals found in Africa, Arabia, and Syria. In appearance



Hyrax, an African mammal

they are not unlike rabbits without the long ears; but they belong to the hoofed group, and in spite of their small size come zoologically near the horses. They are the animals called conies in the Bible. There are about 20 species, and they live in holes and feed upon leaves and young shoots. Their toes are protected by broad nails or hoofs and they are expert climbers. They are about 20 ins. long, and their short fur is brown.

Hyrcaus I, JOHANNES (d. 105 B.C.). King of Judaea and high priest of the Jews. Son of Simon

Maccabaeus, he withstood the opposition of Ptolemy, who murdered his father and his two brothers. He threw off the yoke of Syria, extended his kingdom over Samaria and Idumea, destroyed the rival temple on Gerizim, and, entering into an alliance with the Romans, founded the monarchy which continued in his family until the time of Herod.

Hyrcaus II (d. 30 B.C.). Maccabean king of Judaea. Son of Alexander Jannaeus and grandson of Hyrcanus I, and a man of weak character, he became high priest on the death of his father, and king of Judaea on the death of his mother, Salome Alexandra (d. 69 B.C.). He was forced by his younger brother Aristobulus II to resign both the office of high priest and the kingship. The contest brought Pompey to Jerusalem, 63. Pompey defeated Aristobulus and restored Hyrcanus to the high priesthood, in which he was confirmed by Caesar, 47, who made him a nominal ruler with Antipater, the Idumean (d. 43), who was made procurator of Judaea in 46, and used Hyrcanus as a tool.

When Judaea was invaded by the Parthians in 40, Hyrcanus was taken prisoner, had his ears cut off, and was carried off into Seleucia, his son Antigonus (beheaded by order of Antony, 37) being made king. Invited later to return to Jerusalem, Hyrcanus was put to death by order of Herod, son of Antipater, on a charge of treason. Herod married Hyrcanus's beautiful granddaughter Mariamne (*q.v.*). See Josephus's *Antiquities* and *Wars of the Jews*.

Hyrieus. In Greek mythology, the son of Poseidon and king of Hyria in Boeotia. It is said that a treasure house was built for him by Agamedes and Trophonius, containing one movable stone which allowed them to enter the treasury and rob it at their will. A trap was laid for them by Hyrieus, and to save himself Trophonius cut off his brother's head and fled to Lebadea, where he was swallowed up by the earth.

Another Hyrieus or Hyreus, a prince of Tanagra, and son of Neptune and Alcyonē, besought the gods to give him a son without marrying again, as he had promised his first wife to remain single after her death. The gods granted his prayer and directed him to put water in the hide of a bull, and bury it in the ground for nine months. At the end of that time Hyrieus opened the ground, and therein he found the promised

child in the bull's hide whom he called Orion (*q.v.*).

Hyslop, JAMES (1798–1827). A Scottish poet. Born at Damhead in Dumfriesshire, July 23, 1798, he taught himself French and Latin and a certain amount of mathematics, and while engaged as a shepherd began contributing to the Greenock Advertiser under the pen-name of The Muirkirk Shepherd. In 1818 he opened a school at Greenock and wrote for The Edinburgh Magazine. Faced with unexpected financial difficulties, he sailed to South America on H.M.S. Doris, and described the voyage in The Edinburgh Magazine. On his return he became a reporter for a short while in London before sailing as a tutor on H.M.S. Tweed. He died October, 1827, of fever near the Cape Verde Islands, and was buried at sea.

Hyslop's complete poems were published at Glasgow in 1887. His famous poem The Cameronian's Dream appeared in The Edinburgh Magazine in 1821, and was set to music by Hamish McCunn. See Poems by James Hyslop, with a sketch of his life, P. Mearns, 1887.

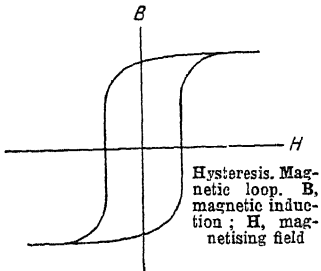
Hyssop (*Hyssopus officinalis*). Aromatic evergreen shrub of the family Labiatae. A native of the Mediterranean region, it has elliptic or lance-shaped leaves, and bluish-purple flowers in whorls; it was formerly used in medicine as a carminative.

It is not the hyssop of Scripture, which has been identified as the caper plant (*Capparis pinosa*).

Hystaspes (6th century B.C.). Ancient Persian prince. He was the son of Arsames and father of Darius I, in whose reign he was governor of Parthia. Hystaspes is the Greek form of the Persian name Vishtaspa, which was also borne by a much earlier ruler in Bactria or Sogdiana, the patron of Zoroaster (*q.v.*). This prince (c. 1000 B.C.) plays a part as Kai Gushtasp in medieval Persian romance, notably in Firdausi's Shāh-Nāme, and has been erroneously identified with Darius's father. Another Hystaspes was a son of Darius I. *Pron.* Hiss-tas-pee.

Hysteresis (Gr. *hysterein*, to come later or behind). Term used in physics for a lagging or retardation of effect when the forces on a body are changed. The name was given to a magnetic phenomenon observed by Warburg in 1881 and independently by J. A. Ewing in 1886. When any substance is magnetised by an electric current it is found that the properties acquired owing to the magnetism

lag behind the magnetising force. The strength of the magnetism in an iron bar, for example, is not the same for the same strength of current when the latter is increasing as it is when decreasing. This fact is illustrated by the typical hysteresis loop shown in the dia-

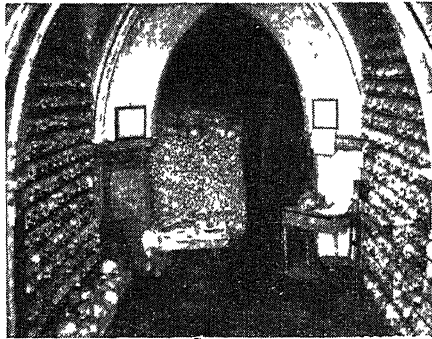


gram, the area of the loop being a measure of the energy lost per cycle. The energy lost is compensated for by a rise in temperature of the magnetised substance, and for that reason in electrical generators and transformers iron and steel are used with as low hysteresis as possible. If the full current of electricity is applied suddenly to magnetise a bar of iron, the latter does not immediately reach its greatest magnetic power, and this is another form of hysteresis. See Magnetism.

Hysteria (Gr. *hysteria*, womb). A psychoneurosis. Ancient physicians believed that the symptoms were caused by the wandering of the womb about the body. The condition is commoner in women than in men, its manifestations—spasms, convulsions, fits of uncontrollable laughter, tremors, anaesthetic areas, loss of voice and of appetite, etc.—being more frequent about the time of the monthly period. Ideas control the body and produce morbid alterations in function. The manifestations do not occur during sleep or, it seems, when the patient is alone, since she never hurts herself. The symptoms can mimic every known disease, but never completely fill the diagnosis of any.

The hysterical personality is well recognized in medicine; it is characterised by lack of stability and of a standard of behaviour, and by the childlike ability to live in fantasy, with childlike need to attract notice and gain sympathy. Psycho-analysis finds the onset of hysteria associated with some particular shock or strain. It is argued that in every case of hysteria there is a past history of inability to make a normal adjustment to environment. Possibly in early life the patient has been

incapable of tolerating some sexual wish on account of the anxiety it caused, and has repressed it. This has produced a state of mental conflict so intense that when the patient seeks to deal in the same way with later shocks and strains, his or her powers of repression fail, and some hysterical symptom results. The stronger the predisposition the smaller the shock necessary to precipitate the illness. Freud's view is that the symptom both symbolises the repressed fears and wishes in a form unrecognized by the sufferer, and affords relief from the anxiety produced by the underlying conflict, e.g. war paralyses disable men from fighting; skin eruptions render a woman unattractive so that a marriage which is unconsciously dreaded must be postponed. For this reason hysteria is classified by Freudians as a defence neurosis.



The cure is in the hands of the physician, who must arrange the pattern of living against a stable background, and of the psychologist who understands and treats these maladjustments of mind, rather than in the prescribing of drugs. The subject is discussed in the first volume of S. Freud's *Collected Papers*.

Hysteriaceae. Minute fungi of the family Ascomycetae, of a carbonaceous or membranous texture, growing on old wood, bark, and dry leaves. The spore-bearing body (ascocarp) bursts through the integuments of its host in an elongated black form and opens by a longitudinal narrow slit. The asci or spore cells are club-shaped and contain four or eight spores.

Hythe. A municipal borough and holiday resort of Kent, also one of the Cinque Ports. It is 67 m. from London and 4 m. from Folkestone, and is served by British Railways and the New Romney, Hythe, and Dymchurch light rly. The chief buildings



Hythe arms

are the church of S. Leonard, with a beautiful chancel; the town hall; the hospital of S. John, originally for lepers, built in the 13th, 14th and 19th cents.; and the hospital of S. Bartholomew, which dates from the Middle Ages. Under S. Leonard's church is a vault with a collection of human skulls and bones. There is a sea-wall and a parade. In the neighbourhood are Saltwood, Shorncliffe, and Lympne (qq.v.), also Romney Marsh.

Hythe was a seaport and borough before the Norman conquest. It was governed by a bailiff and jurats before it received the right to have a mayor in 1575. Its importance declined as the harbour became blocked by sand, but as a watering-place it became popular. In 1854 a school of musketry, later known as the small arms school, was established here.







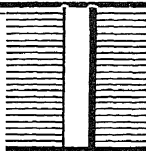
Hythe, Kent. Parish church of S. Leonard, from the N.W.; top, left, crypt under the chancel containing the skulls of thousands of men who are supposed to have fallen in battle some hundreds of years ago




During the Second Great War Hythe was a control centre for anti-aircraft artillery deployed against the flying bombs.

Hythe shares an M.P. with Folkestone. Pop. 8,800.

Another Hythe, in Hampshire, England, is a yachting centre and B.O.A.C. flying boat maintenance base, on the W. of Southampton water, 2½ m. S. of Southampton.

THE Egyptian hieroglyph (5000-4000 B.C.) corresponding to the letter I was a conventional representation of the human hands , less formally inscribed as . The hieratic form (3000-2500 B.C.) was , and this is clearly recognizable in the Phoenician and Semitic form , to which the name *yod* (hand) was given. The Hebrew *yod* deteriorated in size and shape until it differed little from the comma. Hence both the Greek word *iota* and the English *jot* (in the Biblical sense) are still used to express the smallest possible size. But the *iota* itself, from



which both the ninth and tenth letters of the English alphabet are directly derived, was never specially small. The earliest Greek form was . This was simplified into the classic Greek *iota* , to which the Romans added the familiar  series.

The minuscule form was at first no more than a shortened cursive form of the capital letter. The superimposed dot was added only as late as the 14th century, probably to distinguish it in MSS. from the strokes of the letters *m*, *n*, and *u*, with which in Latin the letter *i* is so frequently in close proximity (e.g. *minimus*).

I Ninth letter and third vowel of the English and Latin alphabets. It has two sounds, long as in *mine*, which is really a diphthong; and short as in *pin*, this being the short sound of the Italian long *i* heard in *machine*. The combination *ia* represents *ya*, as in *Christian*, or short *i*, as in *marriage*. *Ie* represents long *e*, the Italian long *i* sound heard in *brief*, *grief*; the diphthongal *i*, as in *pie*; short *i*, as in *sieve*; or short *e*, as in *friend*. *Io* is pronounced as two syllables when *i* is accented, as in *violet*. The endings *-sion*, *-tion*, have a sound midway between *-shon* and *-shun*, unless *s* precedes, when *t* keeps its normal sound, as in *question*. See Alphabet; Phonetics.

Iacchus (Gr. *Iakchos*). In Greek mythology, a mystic deity who played an important part in the Eleusinia (*q.v.*). Later, he was confused with the younger Dionysus, the son of Zeus and Demeter (or Persephonē), the elder being the son of Zeus and Semelē. Iacchus was also the name given to the song sung in his honour at festivals. See Bacchus.

Iago. Second leading male character in Shakespeare's tragedy *Othello*. He is an ancient, or sergeant, under Othello and is filled with envy of his chief's reputation and position and that of Cassio, a lieutenant. Iago plays on Othello's passionate jealousy to suggest that Desdemona, wife of the Moor, has committed adultery with Cassio, thus hoping to destroy them all. The most ruthless and cunning villain drawn by Shakespeare, this character has also plenty of comedy and is often assumed by the principal actor of a company.

Iambic Verse (Gr. *iaptein*, to assail). Lines containing a number of feet, each of which is an iambus or foot of two syllables, the first unaccented or short, the second accented or long. Iambic hexameter is the form of Greek tragedy. Iambic verse is peculiarly adapted to the English language. Rhymed

or unrhymed iambic pentameter is the verse of Chaucer, Spenser, Shakespeare, Milton, Dryden, and Pope. Iambic tetrameter, or octosyllabic verse, was favoured by Scott, Coleridge, and Tennyson (for *In Memoriam*). Iambic trimeter is also employed by English poets, often in association with the iambic tetrameter. In one measure or another iambic is by far the most usual kind of verse in English. See Poetry; Prosody; Verse.

Iamblichus (d. c. A.D. 330). Neo-Platonic philosopher. Born at Chalcois, in Coele-Syria, he was the founder of the Syrian school of neo-Platonism, or rather neo-Pythagoreanism, his philosophy being based mainly upon mystical numerical speculations. He taught the theory of emanations, and in addition to the three divine substances of Plotinus (*q.v.*) introduced a number of secondary triads. His *Life of Pythagoras*, *Discourses Exhorting to Philosophy*, two mathematical works, and one on Mysteries, are extant.

Another Iamblichus (2nd cent. A.D.), a native of Syria and a romance writer, was the author of *Babyloniaca*, an interesting love-story, an abstract of which is preserved in Photius (*q.v.*).

Iana or **YANA**. River of the Yakutsk A.S.S.R., Siberia. It rises in the Verkhoyansk Mts. to the N. of the lower course of the Lena, and running for 600 m. from S. to N., falls into the Arctic Ocean at Murakh. The chief affluents are the Shemanova, Dulgalak, Aditcha, and the Butyntai. The country is desolate, the only places of note being Verkhoyansk and Ustyansk.

Ianthe. Name applied by W. S. Landor, in various poems addressed to her, to Sophia Jane Swift, an Irish girl he knew while residing in Bath c. 1805-08.

Ianthina (Gr. *ianthinos*, violet-coloured). Member of the family Ianthinidae, marine gastropod molluscs with thin violet shells, which float on the surface of the sea. These molluscs form a

curious floating egg-raft of air bubbles entangled in the slime from their bodies. The eggs are deposited on the under side of this raft, which is kept attached to the foot of the animal as it floats. It inhabits the warmer seas; but the shells of four species have been found on the coast of Cornwall.

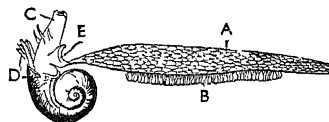
Iapetus. In Greek mythology, one of the Titans. When this race of giants had been defeated by Zeus, Iapetus was imprisoned in Tartarus. See Titan.

Iapetus. Eighth moon of Saturn counting outwards from the planet. Discovered in 1671 by J. D. Cassini, it fluctuates considerably in brightness, and takes a little over 79 days to travel round its orbit. See Saturn.

Iapygia. Name given by the Greeks to the S.E. peninsula of Magna Graecia, S. Italy. It corresponds to the modern prov. of Lecce, in the heel of Italy. The Romans called it Apulia.

Iasi. Modern spelling of the name of the Rumanian city historically known as Jassy (*q.v.*).

Ibadan. District of Nigeria, in Western province. The country generally is rolling plateau, with low hills and fair pastoral and agricultural land. The principal means of communication are the main roads, Ibadan-Oyo, Ibadan-Ilesha, and Ibadan-Ijebu Ode, and the main Iddo-Kano rly., which passes through the chief towns of Ileigbo, Iwo (pop. 74,764), Lalupon, and Ibadan. The last (pop. 327,284) is the largest native town in W. Africa and carries on an important trade in palm oil and kernels, cotton products, kola nuts, and hides. It is 119 m. by rly. N.E. of Lagos and



Ianthina fragilis. A, float; B, ova; C, proboscis; D, branchiae; E, foot. By courtesy of Macmillan & Co., Ltd.

183 m. from Jebba on the Niger. The oil-palm flourishes and constitutes the greater part of the wealth of the country. The native language is Yoruba. When in 1886 Great Britain enforced peace,



Ibadan, Nigeria. The ruler of the country, known as the bale, amid a group of his followers

the country formed an integral part of Oyo. The ruler of Ibadan is called the bale.

Ibagué or SAN BONIFACIO DE IBAGUÉ. A town of Colombia, capital of the dept. of Tolima. It stands in a productive plain, at an elevation of 4,250 ft., 125 m. W. of Bogotá, and is an agricultural centre. The surrounding district yields semi-tropical and temperate products. There are some thermal springs and sulphur mines in the neighbourhood. Pop. 61,447.

Ibañez, V. B. Spanish author, entered in this work as Blasco Ibañez, Vicente.

Ibarra. A city of Ecuador, S. America, capital of the prov. of Imbabura. It stands on the small river Tahuando, at the N. base of the volcano Imbabura, among fruit plantations and gardens, 58 m. N.N.E. of Quito. Motor road and rly. connect it with the latter. Although at an elevation of 7,200 ft., it enjoys an equable if moist climate, and contains a cathedral. It manufactures rope, lace, cordials, and Panama hats. Distilling is carried on, and there are woollen and cotton mills.

The city has often been threatened by volcanic eruptions, and in 1868 it was almost entirely destroyed by an earthquake. The pop., 16,000 before then, is now about 12,000. Ibarra was founded by a Spanish governor in 1597, after the defeat of the Incas. There are many Inca battlefields in the neighbourhood, which abounds in Indian burial places.

Iberia. Name given by the Greeks to the S.W. peninsula of Europe, called by the Romans Hispania. Probably the term referred to the country by the Ebro (Lat. Iberus), inhabited by a race

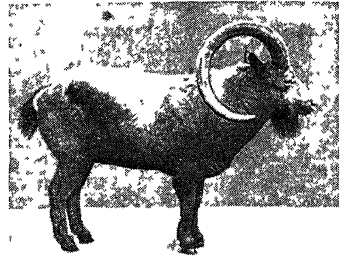
called Iberians, the earliest inhabitants of S.W. Europe of whom there is definite information. Intermingling with Celtic invaders occurred. Present representatives of Iberians are the Basques. The country is still referred to as the Iberian peninsula.

The name Iberia was also borne in ancient times by the region between the Caucasus on the N. and Armenia on the S., corresponding to the modern Georgia. Its inhabitants, the ruling classes of whom belonged to an Iranian stock, were mainly occupied in agriculture. From the time of Trajan nominally forming part of the Roman empire, the country again came under Persian rule after the unsuccessful campaign of the emperor Julian against Sapor in 363. See Spain.

Iberian Mountains. A name sometimes given to the mts. of central and E. Spain, particularly the ranges which include the Sierra de Guadamarra and those S. of the river Ebro. See Spain.

Iberian Sea. Name given to the westernmost portion of the Mediterranean, lying between Spain (the anc. Iberia) on the N., and Morocco and Algeria on the S.

Ibex (Lat.). A small group of wild goats. It includes some four species, all distinguished by fine upstanding, curved horns. The Alpine ibex (*Capra ibex*) is almost extinct in the wild state, though a few herds are preserved by the Italian government. This species has horns over 40 ins. long. The Asiatic ibex (*C. siberica*), which inhabits the mountain ranges of Central Asia, is brown to white in colour, about 40 ins. high at the shoulder, and sometimes has horns over 50 ins. long. The Arabian ibex (*C. sinaitica*) is yellowish brown, with dark markings, and is found in Palestine, Egypt, in the hills between the Nile and the Red sea, as well as in Arabia. The Abyssinian ibex (*C.*



Ibex. Specimen of the Asiatic variety, *Capra siberica*

waliev) is much darker, and has black horns with a curious prominence on the forehead.

Ibibio. A Negro tribe in the Calabar coastland, S. Nigeria. Numbering some 200,000 and living between the Cross and Kwa-Ibo rivers, they are wild, truculent, and much influenced by fetishism.

Ibicuy or IBICUI. River port of Argentina, in the prov. of Entre Rios. It stands near the confluence of the Uruguay with the Paraná, and has a developing river trade. Here the rly. from Buenos Aires to Paraná crosses by ferry the river Paraná.

Ibicui is also a place in Paraguay, where iron mines have been exploited since 1863 and manganese ore deposits occur.

A river of this name in the state of Rio Grande do Sul, Brazil, effects a junction with the Uruguay at Ibicuy. Its length is about 400 m.

Ibi-Gamin or KAMET. Mt. of the Himalayan system, on the frontier of Tibet and the United Provinces of India. It lies in lat. 30° 35' N., and long. 79° 39' E., N.W. of the gigantic Nanda Devi. The neighbouring pass of the same name attains an alt. of 20,459 ft. The peak has an elevation of 25,447 ft. See Himalayas.

Ibis (Gr., Lat.). Group of wading birds, nearly related to the storks, but distinguished by their very long, curved beaks. Numerous species are found in the warm countries of both hemispheres. The Egyptian ibis (*I. aethiopica*),



Ibis. The Egyptian ibis, once an object of worship

worshipped by the ancient Egyptians, is now rare in Lower Egypt, but common from the Upper Nile to the Cape. Its mummied remains are often found in ruined temples. The glossy ibis (*I. falcinellus*) breeds in S. Europe, and is occasionally found in Great Britain.

Ibn Saud (b. 1880). King of Saudi Arabia. Born at Riyadh, capital of Nejd, he was the eldest son of Abdul Rahman, heir to the throne of Nejd; his full name being Abdul Aziz ibn Abdul Rahman ibn Feisal ibn Saud. When the Turks seized Riyadh in 1891, he went with his father to exile in Kuwait. In 1901 Abdul Rahman abdicated all rights to the throne in favour of his son; and the latter set out on an expedition against



Ibn Saud, king of Saudi Arabia

Ibn Rashid, the ruler. He took the fortress of Nejd with only 15 men; Ibn Rashid escaped, and Ibn Saud was proclaimed ruler of Nejd. With victory over the Turks and the death

of his rival, he was left from 1906 in undisputed authority.

His policy was to weld the tribes of Arabia into one nation, and he founded communities where the people lived instead of camping as nomads in the desert. Puritan in outlook, he was called the Cromwell of the Hejaz. In 1913 he formed a standing army and drove the Turks from Eastern Arabia. Apart from an indecisive battle at Jarrab in 1915, he took no action against them in the First Great War until the autumn of 1918. Meanwhile King Hussein of the Hejaz by cooperation with T. E. Lawrence had put himself in a strong position in the peninsula. The two inevitably came into conflict, and in spite of British support, Hussein was decisively beaten by Ibn Saud at Hofuf in 1919.

In 1924 Ibn Saud invaded the Hejaz, Hussein abdicated, and evacuated Mecca, which was occupied by Ibn Saud's Wahabis. On Jan. 8, 1926, Ibn Saud was proclaimed king of the Hejaz, and a year later changed his title to king of the Hejaz, of Nejd, and its dependencies. In 1932 he announced the formation of the combined kingdom of Saudi Arabia.

Friendly relations were established with Great Britain by the treaty of Jeddah in 1927, but were marred by a dispute over the building of forts by the government of

Iraq on the borders of the two countries. Although the Wahabis are fanatical Muslims, with a strongly conservative outlook, Ibn Saud was a progressive ruler, making great use of motor transport and radio. His closing of the Hejaz railway had political rather than reactionary motives. In 1938 he began to raise a large standing army on modern lines. During the Second Great War, Ibn Saud broke off relations with Italy, but his country remained neutral. In 1943 he declared for Arab federation. The eldest of his 32 sons became viceroy of Nejd. *See* Arabia; Hejaz; Hussein, Nejd; Saudi Arabia; Wahabi.

Ibo. Negro tribe in central S. Nigeria. Estimated at 3,000,000 to 3,500,000, if allied tribes are included, they were a powerful people in the 16th century, and now prevail over 20,000 sq. m. from the Cameroons border, N. of the Efik and Ibibio country, and across the Niger to Benin. Varying in skin colour from light olive to ebony, they practise body-painting and scar tattooing. They are devoted to agriculture, their towns being embedded in vegetation, sometimes with sacred enclosures for sacrificial cattle; their huts are adorned with carvings and mud-modellings. Still much addicted to ceremonial dancing, many are Christianised. The Ibo language includes a great diversity of dialects. *See* Aros.

Ibrahim Pasha (1789–1848). Egyptian soldier. Born at Kavala, in Thrace, he was adopted by



Ibrahim Pasha, Egyptian soldier

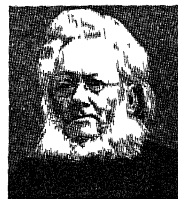
Mehemet Ali, according to report his father, who had established himself as a virtually independent ruler in Egypt. Brought up as a soldier, Ibrahim put down a rising of Arabs in upper Egypt in 1810, and subjugated the Wahabis in Arabia after a war during 1816–18. In the campaign against the rebelling Greeks, 1824–28, he captured Navarino, Tripolitza, and Missolonghi, 1826. After Mehemet's fleet was destroyed at Navarino in 1827, Ibrahim retired from the war.

When Mehemet decided to annex Syria in 1831, Ibrahim captured Gaza and Acre and overran the country. In 1832 the Powers stepped in, and a treaty was signed by which Mehemet received

Syria. Ibrahim was appointed governor, but his exactions led to revolts, and in 1838 Turkey renewed the war. After his victory of Nezib, June 24, 1839, the Powers again interfered, and he evacuated Syria in Feb., 1841. Regent in Egypt for some months in 1848, owing to the mental breakdown of Mehemet, he died at Cairo, Nov. 10. *See* Egypt; Mehemet Ali; Syria; Turkey.

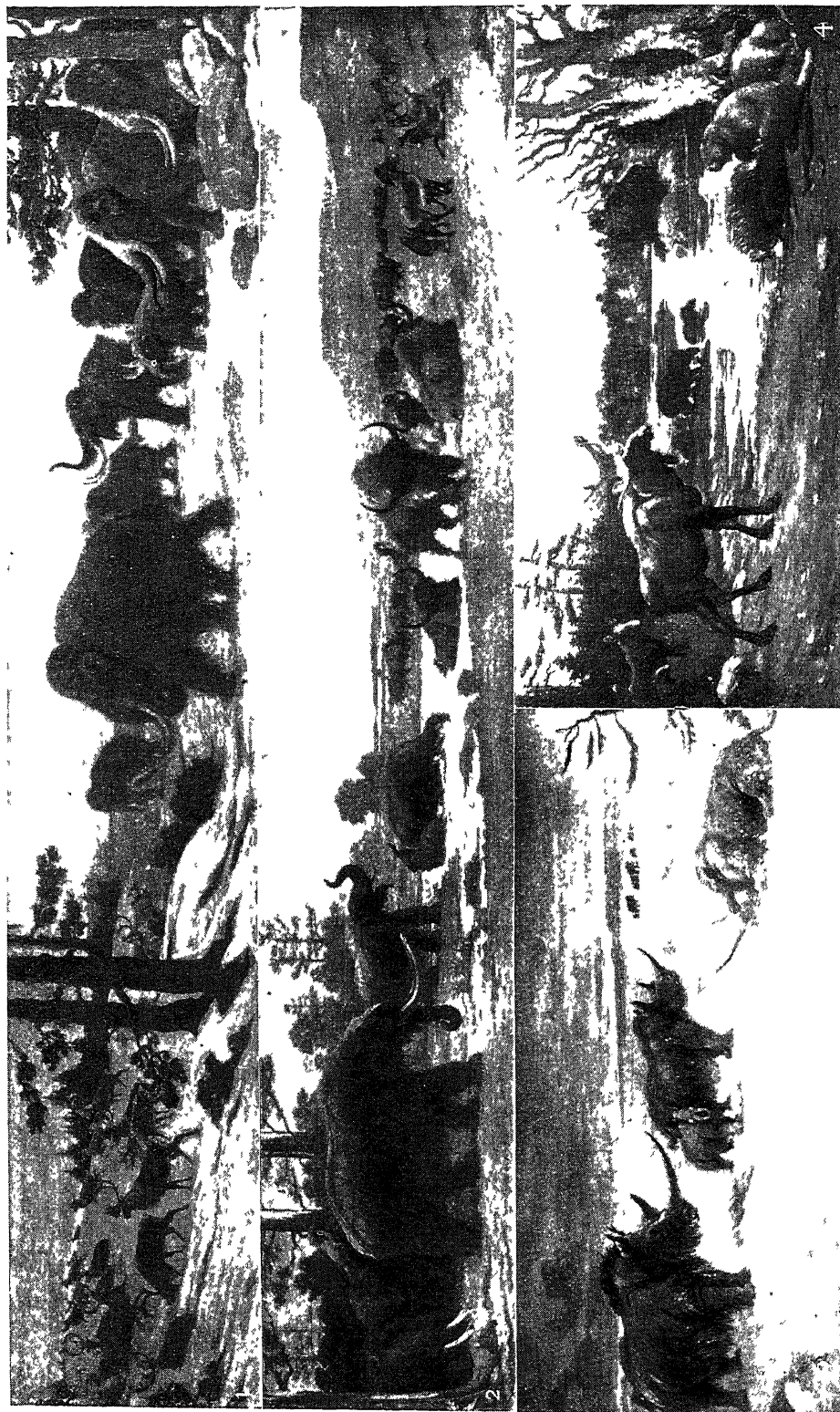
Ibrox. Suburb of Glasgow. In the W. of the city proper, it is mainly a residential area, lying along and around the Paisley Road. Tramcars connect it with the centre of the city. Here are the football ground of the Rangers and Bellahouston Park.

Ibsen, HENRIK JOHAN (1828–1906). Norwegian dramatist and poet. He was born March 20, 1828, at Skien in S.



Norway, his father being a merchant, who met with business reverses. Henrik's boyhood therefore was spent in severe poverty, and he became an apprentice in a chemist's shop at Grimstad in 1843. In 1849 he began to publish sentimental poems and caustic epigrams. In 1850 he went to Christiania (Oslo) with a view to entering the university, but politics and the theatre meant more to him than his studies, and in the same year his first play, *Catilina*, was printed. In 1851, having meanwhile earned his living chiefly by journalism, he was made director of the chief theatre at Bergen, for which he wrote *S. John's Night*, 1853, *Olaf Liljekrans*, 1857, and other plays.

In 1857 Ibsen became director of the new national theatre in Christiania. Here he produced his first really successful play, *The Warriors in Helgeland*, 1858, written in the spirit of the old Sagas. His *Love's Comedy*, the first work in which his gift of bitter satire was conspicuous, made him unpopular and hastened the threatening bankruptcy of the theatre. The university now granted him a small allowance for researches into the folklore of the peasantry. In 1864 the Norwegian government allotted him a travelling scholarship which enabled him to visit Rome, and in 1866 he was granted a poet's pension of about £120 a year. He spent the following eight years chiefly in Dresden. He



1 Herds of reindeer and mammoths of the Somme district, Northern France. 2. Mastodon, Royal Bison, and American horse in the Missouri valley. 3. Woolly rhinoceros and distant herd of mammoths in the Steppe climate, Northern France. 4 Deer, moose, tapir, and giant beaver in Northern New Jersey

ICE AGE : RECONSTRUCTION OF THE FORMIDABLE ANIMAL LIFE THAT ROAMED THE EARTH AT THE CLOSE OF THE GLACIAL EPOCH

From paintings by G. R. Knight, by courtesy of The American Museum of Natural History

continued to live out of Norway, wintering as a rule in Munich, until 1891, when he returned to Christiania. Here he remained until his death, May 28, 1906.

Ibsen's dramatic poems, *Brand*, 1866, which embodied an attack on the pettiness and narrowness of Norwegian officialdom, and *Peer Gynt*, 1867, had established his position as a writer of genius. Of his most famous plays, *Emperor and Galilean* came first in 1873; then *Pillars of Society*, 1877; *A Doll's House*, 1879; *Ghosts*, 1881; *An Enemy of the People*, 1882; *The Wild Duck*, 1884; *Rosmersholm*, 1886; *The Lady from the Sea*, 1888; *Hedda Gabler*, 1890; *The Master Builder*, 1892; *Little Eyolf*, 1894; *John Gabriel Borkman*, 1896; *When We Dead Awaken*, 1900.

The technical revolution effected by these plays was complete. Ibsen got rid of the old rules of exits and entrances, the self-revealing soliloquies and explaining servants, and put on the stage people who told their own story. Often half the plot has taken place before the curtain rises; the drama consists in the subsequent working out. At the time the matter of his plays aroused opposition. He attacked accepted institutions, the family, property, and religion; he asked whether a convention, because it exists, need be right. To ensure that Ibsen's genius should be recognized it needed the disinterested championship of Björnson in his own country, and in England the persistence of Archer, Bernard Shaw, and Gosse. If many of the actual questions posed by Ibsen have now been satisfactorily answered, that does not put his plays out of date, for his characters have a vigorous humanity. They also express his own almost mystical conviction that the only evils are denial of love and suppression of truth.

Bibliography. Collected Works, 1906-12; *Lives*, E. Gosse, 1907; R. Ellis Roberts, 1912; H. Koht, English ed. 1931; *Commentary on Ibsen*, H. H. Boyesen, 1894; *The Quintessence of Ibsenism*, Bernard Shaw, 1891; Ibsen, B. W. Downs, 1946; Ibsen the Norwegian, M. C. Bradbrook, 1947.

Ibycus. Greek lyric poet. He was born at Rhegium in Magna Graecia, Italy, and flourished in the second half of the 6th century B.C. He led a wandering life, and for some time resided, together with Anacreon, at the court of Polycrates, tyrant of Samos. According to a well-known story, he was murdered by robbers on his

way to the Isthmian games, the crime being afterwards detected through some cranes which had flown over the spot and followed the murderers to the market place at Corinth in answer to his dying request. Hence the expression "the cranes of Ibycus" became proverbial for detection of crime by supernatural agency. Of Ibycus's poems, composed for choruses of boys, only fragments survive.

Ica. A maritime department of Peru. It is bounded on the N. by Lima and S. by Arequipa. Its area is 9,796 sq. m. Mountainous in the E., and traversed by low hills in the W., the soil is unproductive except in the valleys, where sugar, vines, tobacco, cotton, rice, and indigo are cultivated. The minerals include gold, copper, and iron ore. Pop. 140,898.

Ica, the capital, founded in 1563, stands on the Putamayo river, 46 m. by rly. S.E. of Pisco, on the coast. Through it runs the Pan-American Highway. Cotton, sheep, and grapes are raised, and there are textile mills and an oil industry. Pop. 21,280.

Icarians. Name given to the members of a communistic settlement founded in Texas in 1848 by Étienne Cabet (*q.v.*).

Icarus. In Greek mythology, the son of Daedalus. While accompanying his father in his flight from Crete, he was drowned near Samos in the sea called after him Icarian. *See* Daedalus.

Ice. Water in the solid state. Water in the pure state freezes at 0° C. or 32° F., at ordinary atmospheric pressure, into a crystalline solid. The crystals are difficult to see in an ordinary block of clear ice, but appear well defined in snow and hoar frost. Whenever water is cooled below about 4° C., expansion occurs. Water thus has the peculiar property of a maximum density at 4° C. Also ice is less dense than water at 0° C. When lakes and ponds are cooled during frosty weather the densest liquid sinks to the bottom until the whole mass is at the same temperature; further cooling causes freezing first at the surface, the ice floating on top. If water followed the usual course of contracting continuously, with fall of temperature the ice would extend from the bottom upwards.

In some rivers on the Continent freezing is a more complicated process, ice forming on the beds and at the sides as well. The freezing of water brings forces into play, through the change in volume, which will burst water pipes.

Impurities mixed with water have the effect of lowering the freezing point, sea-water freezing between -2.5° and -30° C.

The absorption of heat during the melting of large blocks of ice, *e.g.* icebergs, is of climatic importance; the great ice masses of the Arctic influence the climate of N.W. Europe.

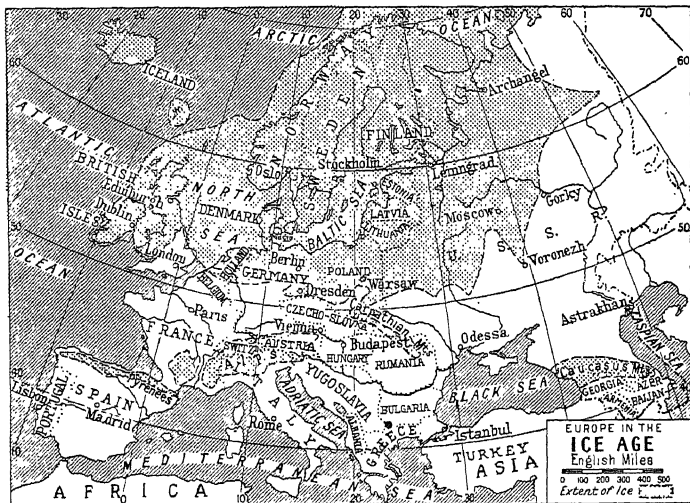
Accumulations of ice on the wings, propeller tips, etc., of aircraft in flight tend to alter the aerodynamic characteristics and present a serious problem to the airman. Ice can be produced by the impinging of supercooled water drops present in clouds on the leading edges of the wings. Heavy coatings of clear ice can result from passage through rain when air temperature is below freezing point (glazed frost). Icing can occur in any type of cloud except those composed of ice crystals (cirrus).

Ice accretion is most likely to occur when the air temperature is anything up to 20° F. (11° C.) below the freezing point. In the British Isles in winter the freezing level falls from an average summer value of 10,000 ft. to about 2,000 ft.

Large quantities of natural ice are harvested and stored for distribution when required, the supply for Great Britain coming chiefly from Norway. On a still larger scale artificial ice is produced for the preservation of food, etc., *e.g.* about 20,000,000 tons being now produced annually in the U.S.A. *See* Freezing Point; Frost; Glazed Frost; Ice-Making; Refrigeration; Snow.

Ice Action. Term used for the wearing away or alteration of the shape of land, rocks, etc., by the action of ice. The expansion of water freezing in cracks in rocks, for example, tends to increase the cracks; floating masses of ice in rivers wear away the banks; glaciers alter the configuration of mountain ranges, grinding down rocks, carrying away huge boulders, etc. All these are forms of ice action, and have had great effect in altering the surface of the earth.

Ice Age. The earlier part of the existing geological period, the Pleistocene. It is called the Great Ice Age because various countries were then overwhelmed by ice-caps like that of Greenland, while the glaciers on the equatorial mountains, *e.g.* Ruwenzori and in the Andes, were more extensive, and those in the subtropical regions like the Eastern Himalayas descended as low as to 3,600 ft., *i.e.* 10,000 ft. below their present limit. Ice covered large areas of



Ice Age. Map of Europe showing the extent of the ice during the period of maximum glaciation. Glacial deposits extended farther south

N.W. Europe, Canada, and the northern U.S.A., and, as it melted, the included earth and stones were spread out in vast sheets of irregular deposits, which were known as the "diluvial drifts," until Agassiz recognized them as laid down by ice.

Glacial deposits cover most of the British Isles N. of a line from the Thames to the lower Severn. Ice from Scandinavia spread S. into Germany, while the glaciers of the Alps and Pyrenees were more extensive than at present. Small glaciers existed as far S. in Europe as the Balkans. In the S. hemisphere large glaciers occurred in Tasmania and New Zealand.

The depositing of sediment by the melt-water set free by withdrawing ice sheets in Europe enables estimates to be made of the climatic variations during the period of deposition. With the summer flows only the coarser sediments would be deposited, while with the slower autumn flows the finer ones would be deposited. Thus banded sediments known as varved clays were formed, the thickness of the bands or varves corresponding to the flow of water at different times of the year, and their number affording a means of dating depositions.

That the British glacial drifts were formed under cold conditions was proved by the fossils found with them. Arctic shells occur in the marine beds; the reindeer, the Siberian or Saiga antelope, and the musk-ox lived in the Thames valley; and some of the extinct animals, e.g. the mammoth, were clad in long fur.

The widespread glaciation was at first attributed to astronomical causes. A general fall of temperature due to a diminution in the heat received from the sun would, however, reduce evaporation from the sea, and therefore lessen the snowfall and decrease the size of glaciers. The cause was more probably geographical, differences in the arrangement of land and water leading to changes in the winds and a different distribution of rainfall and snowfall. The snowfall was concentrated successively at different areas, which then became great glacial centres. The ice-sheets several times increased and waned, the glaciations being separated by warmer periods.

Man was contemporary with at least the later glaciations, his remains being found in England and France with the mammoth and reindeer in beds earlier than the last glacial deposits. Ice ages early in the earth's history have been proved in the Cambrian in Central China and the subtropical districts of S. Australia; also in the Carboniferous in S. Africa, S. America, Australia, and Central India. See Fossils; Mammoth; Man.

J. W. Gregory

Bibliography. Climate and Time, J. Croll, 1885; The Cause of the Ice

Age, R. S. Ball, 1891; The Great Ice Age and its Relation to the Antiquities of Man, J. Geikie, 3rd ed. 1894; Quaternary Ice Age, W. B. Wright, 1914; Dating the Past, F. E. Zenner, 1946.

Ice Axe. Implement comprising both axe and pick for cutting steps in ice or hard snow. Its length should not exceed 45 ins. Principally used in ascending ice slopes, it is part of a mountaineer's equipment. See Mountaineering.

Ice Barrier. Line of cliffs of ice forming the oceanward coastline of the Antarctic ice shelves. The largest is in the Ross Sea, discovered in 1842; rising sheer to over 200 ft., it stretches more than 400 m. from Marie Byrd Land to South Victoria Land. The Bay of Whales, used as his landing place by Admiral Byrd in his South Polar expeditions, is in the Ross Barrier.

The position of the ice-barriers is not constant. When Borchgrevink sailed to the Antarctic in 1898 he found the Ross Barrier much farther S. than it had been reported in 1842. Recent expeditions state that it is now moving N. at about a quarter of a mile yearly. Erosion by sea and internal pressure in the ice give rise to continual "calving" by the barriers, i.e. to the formation of icebergs which break off from the main cliff face. Ice barriers do not occur at the North Pole, owing to the different configuration of the land. See Antarctic Exploration; Ice Shelf; Ross Sea.

Iceberg. Mass of land ice which has broken away from a glacier or ice sheet. When a glacier or ice sheet reaches the sea, the ice is buoyed up by the water, or cut by wave motion, so causing masses to break off. About one-ninth of an iceberg is above the water, and Arctic bergs have been seen 300 ft. high, i.e. 2,400 ft. below water. Greenland ice sheets and glaciers form most of the Atlantic icebergs, rarely seen below 40° N.

Glacier icebergs are irregular in shape, broken up by crevasses, and greenish in colour. Those which have broken away from the great ice barrier and are characteristic of the Antarctic are somewhat rect-



Iceberg, showing, on the left, rough face caused by recent fracture

angular and whiter in appearance. Their thickness may be several hundred feet, their length above ten miles. Icebergs constitute a grave danger to shipping. See Antarctica; Polar Regions.

Icebreaker. Ship specially designed to break its way through ice-bound waters. The bow, reinforced to enable the ship to shatter blocks of ice, is somewhat spoon-shaped so that it tends to climb the ice and break it downwards by weight. Some icebreakers simply clear a passage for other vessels, but frequently they combine that function with that of tugs or train ferries (e.g. on the Great Lakes in N. America).

Russian icebreakers have done outstanding work in North Polar exploration: the Krasnina rescued the crew of the Italian airship Italia which crashed in the Arctic in 1928; the Georgi Sedov cruised from Archangel to Franz Josef Land by way of Novaya Zemlya and Northland in 1930; the Malygin had a dramatic meeting with the Graf Zeppelin off Hooker Island in 1931; and in 1938 the Taimyr and the Murman relieved an expedition under Papanin which had been camped on an ice-floe near the North Pole for nearly a year.

Ice Cap. An area of ice which covers the whole South Polar region within approximately the 75th parallel of latitude. On land it has formed innumerable glaciers, some flowing in ice-worn valleys, others making a continuous ice-front running into the sea. Above the sea the ice cap takes the form of shelf ice, floating islands of ice anchored to the mainland by the glaciers which feed them. The depth of the ice cap has never been sounded, but it is estimated to vary between 500 and 1,500 ft. in the ice shelves and rise exceptionally to 2,000 ft. on land. Of the 5,000,000 sq. m. which make up the Antarctic continent, less than 100 sq. m. is not permanently covered with ice. Similar conditions to those of the Antarctic ice cap are encountered occasionally in the North Polar region, but there is no widespread ice cap and shelf ice is unknown. See Antarctica.

Ice Cream. General term to describe a variety of frozen compounds, prepared from ingredients which may include water and sugar, with fruit juice or other flavouring, and in the richer forms, cream and eggs. The simplest form is the water-ice or sorbet, made from a syrup obtained by boiling sugar in water, to which fruit flavouring and sometimes white of egg are added, the mixture being frozen rough. But this is not usually classed as an ice cream. The word cream indeed has become

In 1947 the ministry of Health introduced regulations by which all ice cream sold to the public must be sterilised by heat treatment, a practice long standard in the U.S.A. The mixture is heated to 150° F. for 30 mins. or to 160° for 10 mins. and then cooled to not more than 45° for an hour and a half before being frozen. The ice cream must be stored at a temperature of not more than 28° until sold. Thermometers must be used during manufacture.

Confectioners and chefs have devised attractive dishes from ice cream in combination with fruit, fruit juices, hot sauces, etc. These include various sundaes and parfaits, with such names as Coupe Jacques, and Knickerbocker Glory. Most of these originated in the U.S.A., where consumption of ice cream per head is much greater than in any other country in the world.

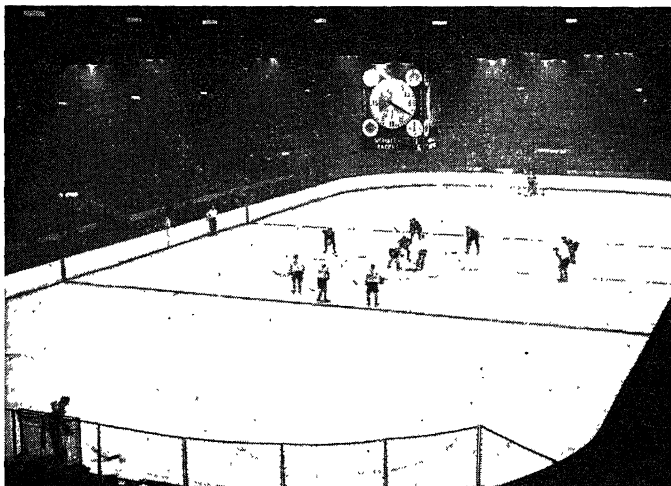
Ice Hockey. Game similar to hockey (*q.v.*), played upon ice. It is Canada's national winter game, and is said to be the fastest game in the world. The actual origin of ice hockey is unknown, but it was certainly played in the Fen district as far back as 1813, introduced into Canada in the garrison cities of Halifax and Kingston 40 years later, and re-introduced into the U.K. at the beginning of the 20th century by Canadian students who played at the old Princes skating club. Not only in the U.K., but also on the Continent, the game was formerly known as bandy. In Sweden bandy continues to be popular.

Ice hockey is played by two teams of six; substitutes may



Icebreaker at work to keep the riverway clear on the Northern Dvina

something of a misnomer when applied to most commercial ice cream products of the U.K. These are made on a large scale. The mixture, originally of milk, cream, and sugar, is now more commonly prepared from starch in some form or fats. This is poured into tanks, cooled, and allowed to stand for 24 hours. It is then transferred to containers or moulded into bricks and wrapped in paper. These are transferred to the freezing room (10–20° F. below zero), and thence they are sent direct to the retailers.



Ice Hockey. The rink at Harringay, London; the scoring clock, suspended over the centre, is the only one of its kind in Europe



Ice Hockey. Game in progress during the world ice hockey championship held at Prague, Feb., 1947

replace the players during the match. Owing to the great speed at which the game is played and the risk of injury, players may wear protective equipment. Skates of any approved design may be worn. The sticks are of wood or other approved material, and must have no projections. From the heel, they must not exceed 53 ins. to the end of the shaft, 14½ ins. to the end of the blade. The blade must not exceed 3 ins. in height, except for the goalkeeper's stick, which must not exceed 3½ ins. except at the heel where it must not exceed 4½ ins. The puck, a flat round disk made of vulcanised rubber or other approved material, 1 in. thick and 3 ins. in diam., is used in place of a ball. Its weight must not be less than 5 oz. or more than 6 oz.

The game is divided into three periods of 20 minutes' play, with 10 mins. rest between periods.

The rink should be about 200 ft. by 80 ft. and should be surrounded by a wooden wall or fence—the boards—not more than 4 ft. and not less than 3 ft. 4 ins. in height from the surface of the ice, free of any obstruction or object that may injure the players.

Playing positions are: goalkeeper, left and right defence, right wing, centre, left wing. Play is started by a face-off. The two players taking the face-off must stand squarely each facing his opponent's goal and with the full blade of his stick on the ice. No other player is permitted within 10 ft. of the face-off. The referee drops the puck between the sticks of the facing-off players, which must remain on the ice until the puck touches it.

Primarily the stick must be used for playing the puck, but kicking is permitted. A kicked goal, however, is disallowed. The puck may be stopped by the hand, but it must not be clutched or held except by the goalkeeper,

who must not hold it longer than 3 secs.

A player is sent off the ice without replacement for 2 mins. as a minor, 5 mins. as a major penalty. For certain misconduct offences the offending player is sent off the ice, but may be replaced; or he may be sent off the ice for the rest of the game.

The first ice hockey league in the U.K. was formed during the season 1897-98 when five teams played against one another, the Niagara (eventual winners), Princes, Henglers, Cambridge, and London Canadians. This league organized a competition each season, except in 1912, until the First Great War, Princes winning it five times and Oxford Canadians four. The British ice hockey association, the controlling body for Great Britain, was not created until the 1913-14 season.

In 1908 an international federation, with Great Britain, France, Belgium, Switzerland, and Bohemia as founder members, was formed. When the Second Great War started in 1939, its membership had increased to 20, and, at the international congress, held at Prague in February, 1947, 19 countries were represented, Germany and Japan being excluded. The international federation arranged world and European championships.

With the outbreak of the First Great War ice hockey ceased, and very little was played in Great Britain for years afterwards. A British club, however, won the

international tournament at St. Moritz in 1922 and 1923. Ice hockey was first included in the Olympic games in 1920 at Antwerp; Canada won, and the U.S.A. was second. A team from Great Britain entered in the Olympic games at Chamonix in 1924, finishing third after Canada and the U.S.A. In 1936 Great Britain won not only the Olympic title but also the world and European championships—the first team ever to win the three titles in one year. But though every member of that team had been born in Great Britain, most of them had gone as children to Canada and learned to play ice hockey there. Great Britain won the European title also in 1910, and again in 1937 and 1938.

In 1927 an ice club was opened in Grosvenor Road, London; the building of other rinks followed, and the game increased steadily in popularity until in 1939-40 Canadian army teams participated in a specially organized league, playing more than 60 games.

After a break enforced by the Second Great War, league and competition play was resumed for the 1946-47 season with seven clubs participating in the national league—Racers and Greyhounds at Harringay; Panthers at Nottingham; Lions and Monarchs at Wembley; Tigers at Brighton; and a club at the Streatham rink.

John F. Ahearn, Sec.,
British Ice Hockey Assoc.

Icel. Vilayet of Asiatic Turkey. Bordering the Mediterranean and facing Cyprus, it has Adana (Seyhan) to the E. and Konieh to the N. From the slopes of the Cilician Taurus several streams run S.E. to the coast. Tarsus and the port of Messina are in the vilayet. Pop. 280,102.

ICELAND: ITS HISTORY & LITERATURE

A. G. Crawley, Lecturer, University of Leeds

The story of an independent republic in the far north, little larger than Ireland and 500 m. from the nearest point of Europe, which has nevertheless developed a sturdy European culture of its own.

See also *Reykjavik*; *Sigurðsson, John*

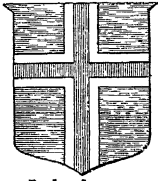
The republic of Iceland is an island lying between lat. 63° 23' N. and the Arctic circle, 156 m. E. of Greenland and 500 m. from the north coast of the British Isles. The journey of 900 m. from Leith, the port of Edinburgh, to Reykjavik, the capital of Iceland, takes roughly four days by passenger steamer, the crossing by air from Reykjavik to Prestwick in Scotland takes only five hrs. Iceland, in fact, has, since the coming of air

travel, lost its age-old isolation.

Because of its northern situation Iceland has scarcely more than two hrs. of light on the shortest day in winter, and about the same number of hrs. of darkness on the longest day in summer. Icelandic mean time is one hour behind Greenwich mean time, and four hrs. ahead of New York time.

Iceland has an area of 39,709 sq. m., its greatest length is 300 m., its greatest breadth 200 m.

PHYSICAL FEATURES. Of its whole area barely a quarter is habitable; this is made up of the lowlands in the S. and S.W. and of the valleys running up from the numerous bays and firths that indent the coast, except in the S. The fjords in the S. have been filled up during the ages by glacial rock waste, so that the S. coast is now harbourless. Fortunately for fishermen, however, the Vestmanna Islands, which have a good harbour, lie only about 12 hrs. by trawler from Reykjavik.



Iceland arms

The interior of the country is a mountain plateau from 2,400 to 2,700 ft. above sea-level, strewn with enormous glaciers, lava fields, volcanoes, hot springs, rivers, lakes, waterfalls, and other remains of volcanic eruptions and signs of ancient glacial activity. It stretches from Vatnajökull in the E. (*jökull* means glacier) by way of Hofsjökull and Langjökull to Faxa Bay on the W., where it ends in impressive mountain ranges on each side of the bay. At the end of the northern range stands Askja Snæfell, while in the southern range towers Esja, dominating the harbour of Reykjavik.

This mountainous waste is cut through by innumerable rivers, large and small, useless for navigation, but teeming with salmon and trout and invaluable as sources of electric power. Thus the electricity for Reykjavik and its environs is supplied from Ljósafoss, a power-station on the Sog river just S. of Thingvallavatn. Thingvallavatn in the S.W., with an area of 25 sq. m., and Myvatn in the N. are the best known and perhaps the most beautiful lakes in Iceland, but there are many others. Of the numerous waterfalls mention must be made of Gullfoss (to the E. of Thingvallavatn), Godafoss on the R. Skjalfandi, and Dettifoss in the N.W. on the Jökulsá, and Hengifoss in the E., the highest (approx. 380 ft.).

The highest mt. in Iceland, the volcano Oraefajökull (6,425 ft.), is part of the glacier Vatnajökull. Mt. Hekla, (*q.v.*) 5,108 ft., the famous "burning mountain" (and, according to legend, one of the main-gates to hell), is in the S. of the country; its last serious eruptions were in 1912 and 1946. An exceptionally disastrous eruption, even in Iceland's long volcanic history, was that of Laki (to the S.W. of Vatnajökull) in 1783, when a lava stream some 45 m. long and 15 m. broad spread over the countryside.

Hot springs are found everywhere, both the eruptive kind, like the Great Geyser in Haukadalur which has given its name to all other eruptive hot springs in the world, and the non-eruptive wells, some of which are low enough in temperature to make fine natural swimming baths. Many of the hot springs are used to heat houses (Reykjavik is now heated in this way) and greenhouses in which flowers, fruits, and vegetables are cultivated.

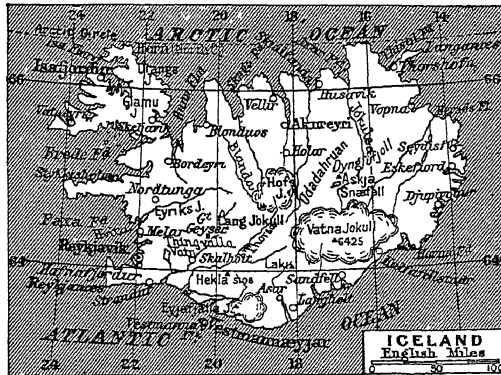
CLIMATE. In spite of its forbidding name, Iceland has a remarkably mild climate for a country so far north, due in large measure to the moderating influence of the Gulf Stream. The average Jan. temperature in Reykjavik (S.W.) is 30° F. and in Akureyri (N.) 27° F.; the average July temperatures are

ANIMAL LIFE. There is much bird life, but no wild animals except the mountain fox and the reindeer, which were introduced into Iceland in the 18th century.

ORIGIN OF THE ICELANDERS. The Icelanders are descended from Norwegian settlers, the chiefs and their followers, who left Norway rather than become subject to King Harold Fairhair. The Norwegian viking Floki, to whom Iceland owes its name, spent one summer and winter there in A.D. 865-6; but the first permanent settlement was made in the year 874 by another Norwegian, Ingolf Arnason, who claimed land for himself where Reykjavik now stands. According to Ari the Wise, the author of *Íslendingabók* (The Book of the Icelanders), "in sixty winters Iceland was all settled, and no settlement was made after that time." Many of the Vikings came from the British Isles, where they had previously settled, and brought Irish and Scottish wives, followers, and slaves with them.

Some Icelandic scientists believe the Celtic admixture to be as much as 30 p.c. The Icelanders are, on the whole, darker in hair and complexion than the other Scandinavian peoples.

An Icander, Eric the Red, discovered Greenland (*q.v.*) in 981, and gave it a deceptively pleasant name which attracted



Iceland. Map of the North Atlantic island, which is now an independent republican state

51.7° F. and 51.5° F. respectively. The yearly rainfall is much heavier in the S. (about 50 ins.) than in the N. (from 12 to 17 ins.), which is protected by the central mt. mass from the moisture-laden southerly winds of the autumn and winter. On the other hand, the N. has more snow than the S. Iceland has long periods of gales and grey, stormy weather, especially in winter, but on fine summer days the atmosphere is crystal clear and the light effects are then extremely beautiful.

VEGETATION. Because of its comparatively mild climate, Iceland has a profusion of wild flowers in spring and summer and rich grass for pasturing sheep and horses. There are, however, few trees of any size.

settlers to it. These settlements survived until the 15th century.

POPULATION AND CHIEF TOWNS. The pop. of Iceland when the first census was taken in 1703 was c. 50,000. By 1901 it had risen to 78,000, and in 1945 was 130,000. About the turn of the century a large number emigrated to Canada and the U.S.A.

The capital of Iceland is Reykjavik with a pop. of 46,578; the second largest town is Akureyri (pop. 6,144). Other towns include Hafnarfjörður (4,249), near Reykjavik; Ísafjörður (2,919), centre of the herring industry, in the N.W.; and Siglufjörður (2,877) in the N.

RELIGION AND EDUCATION. The R.C. faith was adopted by law in the year 1000 at a meeting of the

althing, where it was also decided that the old heathen rites might still be practised, on condition that no witnesses were present. This wise and tolerant compromise continued until 1550, when the Reformed religion was introduced by royal command against the will of the people, resulting in a period of fanaticism and oppression. Today the ancient feuds are forgotten, and the national Evangelical Lutheran church exists peacefully with the R.C. and Free churches.

Education is controlled by the state, and ranges from nursery schools to the university of Iceland (Haskoli Islands), which has more than 300 students, many of whom go abroad at their own or the government's expense in order to continue their studies. The faculty of medicine, which is especially strong, is the basis of an excellent state medical service and a reminder that the famous light therapist, Niels Finzen (1860-1904), was a scientist of Icelandic birth.

NATURAL RESOURCES. The only minerals of value are calcareous spar and sulphur; iron, steel, timber and cement all have to be imported. Iceland also imports grain, salt, woollen and cotton goods, and most of its luxuries. To pay for these imports, the Icelanders depend on fishing and (to a less extent than formerly) the rearing of sheep, ponies and cattle. Some of the richest fishing grounds in the N. Atlantic lie off the coasts, and fish and fish-products are the basis of the country's economy. Iceland does most of its trade with Great Britain, Denmark, and the U.S.A., also, in normal times, with the Mediterranean countries. Various industries, especially in connexion with

fishing, made possible by the exploitation of water power, were stimulated by the difficulties in international trade during the Second Great War.

Until the introduction of motor vehicles just before the First Great War, all transport on land was by pack-horse; there were no roads fit for heavier traffic. Until 1906 there was only one telephone line, seven miles long. Farmhouses were of sod on a timber frame; most town houses were of wood. Forty years later, though there was no rly., Iceland had taxicabs, buses, and aeroplanes for inland transport, steamers for coastal traffic, passenger boats and air liners for foreign travel, concrete houses and public buildings, a radio station, cinemas, cheap electricity, and central heating from the hot springs.

CONSTITUTION. The first settlers founded in 930 a general assembly (*althing*) with legislative and judicial powers over the whole country. This met each summer to make laws and judge lawsuits. It had no executive authority, however, for this remained in the hands of the principal families that had settled the land.

The essential unit of Icelandic society at this period was the family, and the stability of this society depended on respect for blood ties and loyalty to the *godi*

The republic came to an end, and the authority of the *godi* was abolished. In 1380 Norway was united with Denmark through marriage, and, with Iceland, came under the Danish crown.

During the next four centuries plagues, famines, volcanic eruptions, and the stranglehold of the Danish trade monopoly (established in 1602 and not abolished until 1854) inflicted severe sufferings on the Icelanders. The scholar Jon Sigurdsson (1811-79) was the leader through whose efforts Denmark granted Iceland its own legislature in 1871, home rule in 1903. The Act of Union, 1918, made Iceland a free and sovereign state united with Denmark only through the fact that the king of Denmark was also king of Iceland, Denmark retaining, however, control of foreign relations. This Act lapsed on Jan 1, 1944, and a referendum in May at which 98 p.c. of the electorate voted gave 70,725, against 370, in favour of separation from Denmark; 69,048 in favour of a republic, which was proclaimed on June 17 (the birthday of Jon Sigurdsson).

The althing (parliament) of 52 members, two-thirds forming the lower house, the other third (elected by the whole althing) the upper, is elected on a system of proportional representation by all men and women over 21.

THE SECOND GREAT WAR. In view of submarine and air warfare the position of Iceland in the N. Atlantic was of prime strategic importance. Her inhabitants, whose only armed forces were 70 policemen, could not have defended the island effectively. The number of Germans there increased considerably after the outbreak of war in 1939, and a strong local Nazi party had been organized by the German consul.

Germany invaded Denmark on April 9, 1940. The althing thereupon assumed the royal prerogative, establishing direct diplomatic relations with the U.K. and the U.S.A. On May 10, a small force of British troops landed in Iceland, where they installed coastal defence guns and laid out airfields, from which the Royal and Royal Canadian Air Forces flew patrols in Catalina flying-boats. U.S. naval and military forces partially relieved the British on July 7, 1941, Iceland then becoming a vital link in the defence of the shipping carrying lease-lend goods to Great Britain. By Nov. 1942, all British military forces had been withdrawn, though the



Iceland. 1. Girl of Reykjavik in bridal head-dress. 2. Women washing clothes and making coffee at hot springs. 3. Group of haymakers

or local chief. It disintegrated in the 13th century, when the principal families became engaged in bloody and unending feuds. King Haakon Haakonsson of Norway, taking advantage of the chaos, persuaded the Icelanders to swear allegiance to him in 1262.

navy and R.A.F. remained. The presence of foreign troops was disagreeable to the Icelanders, but there was no active opposition; the Allied forces, who did not interfere in the internal affairs of the country, were withdrawn following the end of hostilities.

Bibliography. The Icelandic Year-Book; Letters from High Latitudes, Lord Dufferin, 1858; History of Iceland, K. Gjerset, 1924; Letters from Iceland, W. H. Auden and L. Macneice, 1937; Iceland, Past and Present, B. Thordarson, 1945; History of Education in Iceland, G. T. Trial, 1945; Icelandic Church Saga, J. C. F. Wood, 1946.

LANGUAGE, LITERATURE, ART. Icelandic is a N. Germanic language closely related to Norwegian, Danish, and Swedish, so that an Icelanders has little difficulty in picking up these Scandinavian languages. It is a highly inflected tongue, much more so even than German, and it has few foreign words because the genius of the language prefers to form new compound words rather than to borrow from abroad. Although it has undergone some changes in pronunciation during the past thousand years, it is still substantially the same language that was spoken by the first settlers in Iceland. There are few differences between the spoken and the written forms.

Iceland is, above all, remarkable for its literature. Icelandic first became a literary, as distinct from a spoken, language at the beginning of the 12th century, as a result chiefly of the decision of the althing in 1117 to commit all the national laws to writing during the following summer. The learned Ari Thorgilsson (1067-1148) wrote the *Íslendingabok* (The Book of the Icelanders), and probably had a share in writing the *Landnamabok* (The Book of the Settlements), both of which are invaluable sources for the early history of Iceland. Snorri Sturluson (1178-1241), the greatest historian of the north, wrote *Heimskringla*, a history of the kings of Norway down to his own day, and the *Younger Edda*, consisting of a survey of Norse mythology and a discussion of skaldic diction and metres, with examples by Snorri himself. Snorri quoted copiously from the *Voluspá* (The Sibyl's Prophecy), *Grimnismál*, and other poems of the *Elder Edda*, a collection of the oldest Norse poetry which dates from the end of the 12th century but contains heathen

poems that must be as old as the 9th. Snorri may also have been the author of *Egils Saga*, one of the finest of the Icelandic family sagas, in which occur two brilliant poems in the elaborate style of the skalds or court poets—*Hofudlausn* (Head-ransom), and *Sonatorrek* (Loss of My Son), which is among the great elegiac poems of the world.

Egils Saga, *Brennu-Njals Saga*, *Grettis Saga*, *Laxdaela Saga*, and *Eyrbyggja Saga*, all dating in their written form from the 13th century but going back much earlier in oral tradition, are the greatest of the histories of the leading Icelandic families. They are masterpieces of story-telling, and are unforgettable for their characterisation and embodiment of the heroic view of life.

In modern poetry, H. Petursson (1614-74), M. Jochumsson (1835-1920), E. Benediktsson (1864-1940), and D. Stefansson (b. 1895) are worthy of mention. Jochumsson is also well known as the translator of several of Shakespeare's tragedies into Icelandic verse. In prose, the leading contemporary novelists are G. Gunnarsson (b. 1889), H. K. Laxness (b. 1902), and K. Gudmundsson (b. 1902); they have all been translated into English and other European languages. More books are published in proportion to the size of the pop. than in any other country of the world.

Sculptures by E. Jonsson (b. 1874) are housed in a splendid museum in Reykjavik. The best of the Icelandic painters—Kjarval (b. 1885), A. Jonsson (b. 1876), and J. Stefansson would be outstanding in any country.

Bibliography. The Icelandic Sagas, W. F. Craigie, 1913; Modern Icelandic Plays, J. Sigurjonsson, 1916; An Introduction to Old Norse, E. V. Gordon, 1927; A Primer of Modern Icelandic, S. Jonsson, 1927; Ships in the Sky, G. Gunnarsson, 1938; Independent People, H. K. Laxness, 1946. The Oxford Book of Scandinavian Verse includes Icelandic poems; trans. of *Brennu-Njals Saga*, *Grettis Saga*, and the *Heimskringla* are included in the Everyman's Library.

Iceland Moss (*Cetraria islandica*). Native lichen of the mountainous regions of Europe, Asia, and N. America. Growing erect upon the ground, it is a thick, branching ribbon of brown colour, the ultimate divisions with fringed margins, and the base stained with crimson. In Arctic regions it is used as food, by boiling into jelly, converting into soup, or drying, and powdering it for use as a sub-



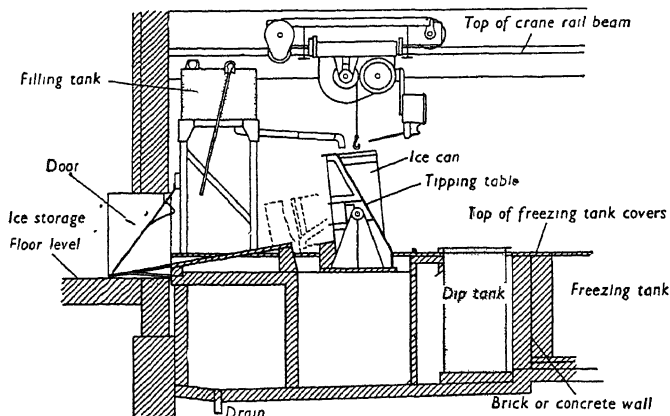
Iceland Moss, a lichen used for food in Arctic regions

stitute for flour. It is also of value as a dye stuff. It was formerly esteemed for medicinal properties.

Iceland Spar. Transparent, colourless variety of calcite, found in Iceland. It has a strong double refractive power and is consequently used in the construction of Nicol's prisms for polariscopes (*q.v.*) and other optical instruments. This power was discovered by Erasmus Bartholinus, and the law of the refraction of the two rays of light by Christian Huygens. The latter made the important discovery that light that had passed through Iceland spar acquired new properties to which the name polarisation has been given. The spar is rare, and, on account of its great demand, expensive. For making optical instruments it is being superseded by the synthetic polaroid. See Polarisation.

Ice-making. Ice owes its usefulness to its convenience in handling and to its great absorption of heat when thawing. Until the advent of automatic refrigeration, ice was the accepted means of food preservation in the home. It still has applications where the cooling hours per year are insufficient to render mechanical refrigeration economical, such as for short shipments of food and for comfort in mild climates. Greeks and Romans used natural ice to chill their wines and dainty foods and on occasions even produced it by radiant cooling, a method still practised in India. Shallow pans containing water are exposed to the clear night sky, towards which the water freely radiates its heat. The pans are placed upon layers of straw to reduce the flow of heat from the ground to the water; this results in the water radiating heat more quickly than it gains it by conduction until it finally freezes.

By the 19th century natural ice had become an article of commerce and the principles leading to its manufacture were being estab-



Ice-making. Fig. 1. Compressor type of plant, showing the lay-out at the end of the freezing tanks for thawing, tipping, and filling
Both diagrams, courtesy of York Shipley, Ltd.

lished. Galileo's thermometer, Boyle's and Charles's laws of gases, and Priestley's discovery of ammonia, oxygen, and carbon dioxide were stepping stones to mechanical refrigeration. In 1823 Faraday liquefied ammonia and carbon dioxide by pressure; a year later Carnot developed the principle of the ideal heat cycle in a closed reversible process. The first machine to produce ice commercially was invented by Carré in 1860: it was of the ammonia absorption type and at first crude. In 1862 Kirk designed an air-refrigerating machine which gave good service in an ice-making factory in Hong Kong.

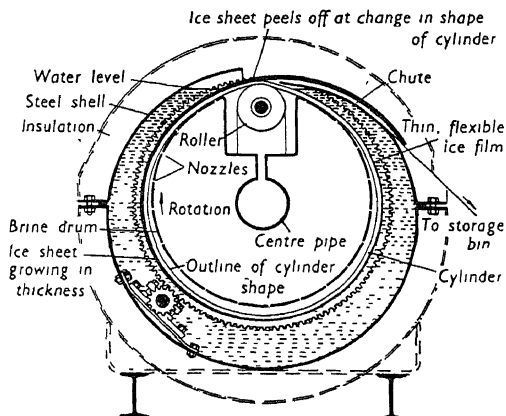
The compressor type of plant, using ammonia or some other refrigerant, is commonly used in ice-making. The usual method is the can system, in which water to be frozen is enclosed in cans and immersed in brine tanks. Evaporator coils for chilling the brine are accommodated in trunks and alongside the can space, the brine being circulated through the coil trunk, distributed evenly between the cans. The water on cooling liberates its dissolved air and, unless the water is agitated, the bubbles become frozen into the mass, producing opaque ice. Agitation can be obtained by injecting dehumidified air into the water

during freezing. Clear ice grows steadily inwards from the sides of the can towards the central air stream until only a thin core of opaque, spongy ice is formed.

When freezing is completed, the cans are lifted in groups, dipped in tepid water to thaw the surfaces, and tilted to release the blocks. The heat for thawing can be supplied from the condensers of the refrigerating plant. Fig. 1 shows a typical lay-out at the end of the freezing tanks.

Domestic refrigerators generally allow for making a small quantity of ice in open divided trays. This idea has been developed commercially in the form of cabinets filled with ice trays.

Another method of ice-making is the continuous ribbon process in which thin strips of ice are peeled from a rotating drum and broken into flakes of dry, sub-cooled ice. The machine (Fig. 2) consists of a tank containing fresh water in which a rotating flexible



Ice-making. Fig. 2. Diagram showing a cross section of the continuous ribbon process

cylinder is almost totally submerged. The cylinder is made up of thin metal belts about 6 ins. wide, forming freezing surfaces separated by rubber strips. Brine is ejected from the inner drum through nozzles on to the inner surfaces of the freezing cylinders, and ice forms on the exterior surfaces in ribbons. The roller at the topmost point of travel, distorts the cylinder from its normal shape, causing the ice to peel off, fall into the bin, and shatter into fragments. See Cold Storage; Refrigeration.

Hugh Bell, A.M.I.H.V.E.

Iceni. Tribe inhabiting E. Anglia at the time of the Roman invasion of Britain. They submitted to the Romans, but revolted under Boadicea (A.D. 61). This rising was put down after a great battle, and little more is heard of them. See Britain.

Ice Pack. Term used for small masses of sea ice or broken fragments of icebergs driven together by wind or currents. They form a more or less compact barrier to navigation in the Polar regions, according as they are being driven towards or off the land. Often the ice pack contains clear channels through which vessels can pass, and even when presenting an apparently continuous sheet of ice it is loose enough for steamers to plough through. See Polar Regions.

Ice-plant (*Mesembryanthemum crystallinum*). Annual herb of the family Picroideae. It is a native of S. Africa, the Canaries, etc. It is dotted all over with glittering raised glands which have the appearance of clear ice. Its stems lie along the ground, and its alternate, oval leaves clasp the stems by their base. The plant is a favourite one for rockeries and flower borders in warm countries, though in Great Britain it is usually grown in greenhouses. The flowers are white, yellow, or red. *M. cordifolium* has heart-shaped green and silvery leaves and bright reddish-purple flowers.

Ice Sailing. Sailing and racing specially built yachts upon ice. The U.S.A. and Canada offer the most favourable conditions for the sport, but it is also practised in Norway, Sweden, the Gulf of Finland, the Netherlands, and to a small extent in Great Britain, where Esthwaite Water, Windermere, and Rydal Water are occasionally frozen sufficiently to support the weight of a small yacht.

The modern ice-yacht consists of a triangular frame moving upon two steel runners, the long steel

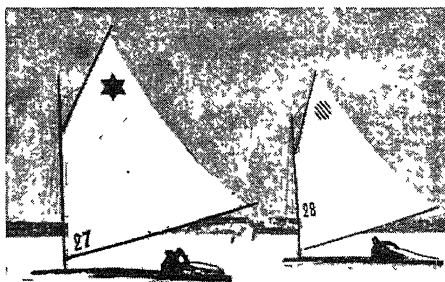
rudder virtually acting as a third. The mast is placed well forward, and the bowsprit is formed by a continuation of the centre timber. The sails usually are mainsail and jib. The tiller is often made very long so that the helmsman can steer with his legs, leaving his hands free to manipulate the sails. Some American and Canadian ice-yachts are 40 ft. in length, and carry six passengers, attaining a speed of 80 m.p.h.; they are suitable for navigation only on large expanses of ice. On the canals of Holland ice-boats are invariably put to practical purposes and not employed in racing.

Ice Saints. Name given to the period May 11-13, i.e. the days of S. Mamertius, S. Pancras, and S. Gervais, respectively, owing to the belief derived from folklore that a frosty spell is to be expected at this time. Although Buchan found a tendency for the period May 9-14 to be cold in parts of Scotland during 1857-66, there is no statistical evidence that such a spell recurs generally.

Ice Sheet. Term applied either to the ice cap which covers the whole of the South Polar region, or to the ice shelves which cover the sea off the coast of the Antarctic continent. In its first connotation it is also used to describe the ice caps found locally in Greenland and Ellesmere Island. See Ice Cap; Ice Shelf.

Ice Shelf. Expanse of floating ice off the coast of the Antarctic continent. Ice shelves are permanent formations, aground at the landward side and anchored by the glaciers which feed them, flowing into them from the South Polar ice cap; on the oceanward side they are afloat, and terminate in sheer cliffs rising in places over 200 ft. (ice barriers), and descending to nearly 1,500 ft. below.

The surface of the ice shelves is mainly flat, but internal stresses caused by the glaciers which enter them from different directions give rise to irregularities. These sometimes take curious forms, and are known as pressure ice. The seaward side of the ice shelves is constantly breaking off into large icebergs, a process known as calving. The largest ice shelves in the Antarctic Ocean are the Ross, in the Ross Sea, and the Filchner, in the Waddell Sea. See Ice Barrier.



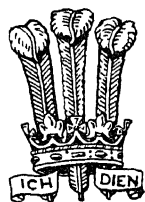
Ice Sailing.

Yacht racing during the Northern Games at Vartan, Sweden

Ichabod (Heb., no glory). Son of Phinehas, and grandson of Eli (1 Sam. 4). Just before his birth his mother heard of the death of her husband and father-in-law, that Israel had been defeated, and the Ark taken. With her dying breath she named her child Ichabod, saying "The glory is departed from Israel."

Ichang. Town in Hupeh province of China. It is situated on the Yang-tse, 270 m. above Hankow, and 965 m. from the mouth, and is accessible to small river steamers. It was opened to foreign trade in 1877. Above the town the great rapids of the Yang-tse hinder navigation from the rich western provinces, Szechwan in particular. A short rly. to Kweichow beside the stream gets over the difficulty in part. Pop. 107,940.

Ich Dien (Ger., I serve). Motto borne by every prince of Wales. It was erroneously said to have been adopted by the Black Prince, together with the three white ostrich plumes, from John, king of Bohemia, who was slain during the battle of Crécy, while fighting in the service of the king of France.



Ich Dien. Prince of Wales's crest and motto

Ichneumon or MONGOOSE (*Herpestes ichneumon*). Small carnivorous mammal, which occurs in Egypt and India. The name means tracker (Gr. *ichneuein*, to track, hunt out). See Mongoose.

Ichneumon Fly. One of a large group of insects belonging to the order Hymenoptera (q.v.) and known as the Ichneumonoidea. They are of minute to moderate size, with thread-like antennae, elongated bodies and legs, and needle-like ovipositors, sometimes as long as the rest of the insect. In their larval stages they live as

parasites, especially on caterpillars. The female lays her eggs on the skin of the host, or more often bores through it, thus depositing her eggs internally.

On emerging, the ichneumon fly larva either lives on the integument of the host, feeding through a perforation; or lies immersed in the blood of the host, devouring the nearby tissues. In either event death of the host almost always supervenes and the ichneumon fly larva pupates either within or outside its remains. The way of life of ichneumon flies renders them useful agents in checking the abundance of noxious insects. More than 2,800 species occur in Great Britain. Consult Entomophagous Insects, C. P. Clausen, 1940.

Ichor (Gr.). In Greek mythology, the ethereal juice or fluid, different from blood, which coursed through the veins of the gods. As a medical term, ichor indicates a watery humour or discharge from a wound or ulcer.

Ichthyol (Gr. *ichthys*, fish; Lat. *oleum*, oil) or ICHTHAMMOL. Adhesive brown substance with a tarry odour and rich in organic sulphur compounds. It is prepared by the distillation of a bituminous shale containing the remains of fossil fish. Found in Tirol, ichthyol and its preparations are used for the treatment of eczema and other skin diseases, including (in photography) developer poisoning. They are mildly antiseptic in action.

Ichthyology (Gr. *ichthys*, fish; *logos*, word). Science of fishes. It is the scientific name given to the branch of zoology that treats of the structure, form, and habits of fishes, also their classification. See Fish; Zoology.

Ichthyophagi (Gr., fish-eaters). Primitive coast-peoples reputed by ancient geographers to subsist on sea-food. Alexander the Great's admiral Nearchus described those of the Gedrosian coast—the Baluchistan Makran—as giving fish to their domestic animals also, and occupying whalebone and conch-shell dwellings. Herodotus referred to those of the Red Sea coasts.



Ichneumon Fly. Specimen of *Ophion luteum*

Ichthyopterygii. Grade of vertebrates in which the limbs are fins. They are contrasted with Cheiropterygii, creatures having fore and hind limbs, as in the tetrapods. The grade includes all true fish from sharks upwards.

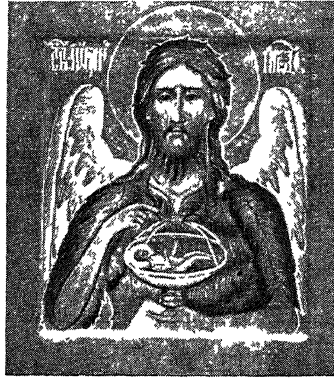
Ichthyornis. Extinct toothed bird. From remains which have been found in the middle Cretaceous of Kansas, it was a strong-flying bird, about a foot in height, and possessing a row of reptile teeth in each jaw. A sea-bird, it fed on fish and nested on the shore. See Bird; Fossil.

Ichthyosaurus (Gr. *ichthys*, fish; *sauros*, lizard). Genus of extinct fishlike reptiles found in the Triassic, Jurassic, and Cretaceous strata in Europe, America, Africa, and Australia. The reptile has been reconstructed from fossil remains and had a round and tapering body, and a large head with long jaws armed with a number of sharp, conical teeth. The neck was extremely short, the limbs like flappers or fins, resembling those of whales, and the tail a vertical fin. The body was covered with a smooth skin, and the reptiles measured anything from 4 to 40 ft. in length. Fossil remains show that they must once have been present in large numbers in European seas. Over thirty different species have been found. See Fossil; Reptile.

Ichthyosis or **XERODERMA**. Congenital hypertrophy of the horny layer of the skin, also called fish-skin disease. The cause is unknown, but the thyroid gland plays some part in giving rise to the condition. All types are characterised by rough, dry, scaly, and dirty brown skin, sometimes over a large area of the body. Warm baths, with a teaspoonful of sodium bicarbonate to the gallon, are sometimes helpful. Olive oil may soften the scales.

Icknield Way. Early English name for a prehistoric track from near Wantage to Dunstable. Following the line of the Berkshire Downs and Chiltern Hills, it may have continued N.E., crossing Ermine Street (q.v.) near Royston, and thence to Caistor. It ranked as one of Edward the Confessor's four royal roads. Icknield—preferably Ryknield—Street designates a Romanised road system from the Fosse Way (q.v.) near Stow-on-the-Wold, through Alcester, Little Chester, and Chesterfield, towards Aldborough.

Icon or **IKON** (Gr. *eikōn*, image, likeness). In the Greek or Orthodox Eastern (including the Russian) Church, a representation in



Icon. Examples of ancient Russian types; left, representing S. John Baptist; right, the Annunciation

the form of painting, low-relief sculpture, or mosaic, of some sacred personage. In a Russian or Balkan church the *bema*, or sanctuary, is separated from the body of the building by the *iconostasis*, a carved screen of wood or stone, on which the icons—usually half-lengths—of the Saviour, Mary, the Apostles, and the Saints are painted, frequently on a ground of yellow or gold. Excepting the face and hands, the whole is often covered with a metal plaque embossed so as to represent the figure and drapery. Icons are common in the streets of towns and villages, and are venerated by the peasants, who generally carry them in the shape of folding tablets, with coloured or enamelled pictures.

Iconium (Gr. *Ikonion*). Ancient city of Asia Minor. It figures in the travels of S. Paul, and was the capital of the Roman prov. of Lycania. It was taken by the Arabs in 708, and during the Seljuk period was the chief town of the sultanate of Iconium or Rum. After several vicissitudes it was captured by the Turks in 1486. Its modern representative is Konieh or Konya, 300 m. E. of Izmir.

Iconoclast (Gr. *eikonoklastai*, image-breakers). Name applied to an opponent of the use of images and pictures in religious worship. From early Christian times, pictures and other representations of sacred persons and emblems were used in the adornment of places of worship, and as early as the 2nd century protests were made against a practice which appeared dangerous in view of the idolatry with which the Church was surrounded. Tertullian and Origen both adopted this attitude; and the council of Illiberis (c. 305) forbade pictures in churches. Eusebius and Augustine also prohibited them, and Epiphanius, bishop of Constantia

(A.D. 367), destroyed a picture of Christ in a church in Palestine.

But the practice became general, and in the 8th century the rise of a party of iconoclasts in Eastern Europe started a prolonged controversy. The Eastern emperors issued edicts forbidding the veneration of pictures or images, while the popes inclined in the opposite direction. The council of Constantinople, 754, forbade image worship, but without permanent effect, for by 842 the iconoclasts were completely defeated. The name Iconoclasts has also been given to the Puritan party in the 16th and 17th centuries who endeavoured to destroy every kind of pictorial or sculptural adornment in churches, including stained glass windows. See Idolatry; Image Worship.

Iconography. Name given to the art of arranging and classifying prints and other illustrations of persons. For instance, an iconography of Chaucer would be an account of all the prints illustrating his life and works.

Icosahedron. Regular solid contained by twenty plane faces, each of which is an equilateral triangle. It is one of the five regular or Platonic solids.

Ictinus (Gr. *Iktinos*). Athenian architect. Little is known of him except that in the 5th century B.C. he was associated with Callicrates in the design and building of the Parthenon under the direction of Pheidias. He was also architect of a so-called temple at Eleusis and of the temple of Apollo Epikourios (helper) at Bassae, in Arcadia.

Id (Lat., that or thing). Term used in Freudian psychology for that part of the mind which is not modified by experience; e.g. the basic instincts which every child inherits as a member of the human race. In normal people Id im-

pulses are repressed so early in childhood that they hardly become effective in their primitive form. In some forms of madness the controlling powers fail and an impulse emerges undisguised; e.g. the desire to kill of a homicidal maniac.

Ida. Mountain range of Asiatic Turkey, now called by the Turks Kaz Dag. This name was given in classical times to a range which stretched from Phrygia through Mysia into the Troad. The highest point, Mt. Gargarus, 5,750 ft., is near the head of the Gulf of Adramyti (Edremid).

Ida (d. 559). King of Bernicia. He probably founded this little English kingdom, over which he ruled 547-59. He fortified Bamborough, his capital, and left Bernicia to his sons, six of whom were in turn its rulers.

Idaho. North-western state of the U.S.A. It touches British Columbia to the N. Its area of 83,557 sq. m., approximately that of England and Scotland, comprises a tableland with mean elevation of 4,500 ft. and many snow-capped peaks exceeding 12,000 ft. Within the Rocky Mountain region, outlying ranges, interspersed with narrow valleys, cover the N.E., while the S. presents a vast lava plain. The central portion of narrow valleys and virtually impassable cañons drained by the Salmon and Clearwater rivers is sparsely inhabited. Forests cover more than a third of the state.

The Snake river, whose navigation is obstructed by magnificent falls, bisects Idaho in the S. and turns N. to form part of the W. boundary. It drains most of the area, which forms part of the Columbia Basin. Agriculture is indebted to irrigation as the soil is arid except where derived from lava rock in the S. and centre. Several of the nation's largest reservoirs and dams are here.

Idaho is one of the leaders in output of silver, lead, zinc, copper, gold, antimony, and mercury. Its potatoes are famous and it yields more apples than any other state save Washington. Other products are wheat, alfalfa, oats, barley, sugar beet, pears, prunes, meat, wool, and dairy products. Cattle and sheep are raised. Timber includes western and white pine, larch, and Douglas fir. Among industrial establishments are beet sugar factories, flour mills, saw-mills, and fruit canneries.

Six state educational institutions include the university at Moscow and the college at Caldwell.

Chief rlys. are the Great Northern and Union Pacific, the total steam rly. track being 2,870 m. Two senators and two representatives are sent to congress. Boise is the capital (pop. 26,130). Lewis and Clark explored Idaho in 1805-06, Mormons arrived as the first permanent settlers in 1842, and the state was admitted to the Union on July 3, 1890. Some 4,000 Indians live in reservations. Pop. 524,873. *Pron.* Ida-hō. *Consult* We Sagebrush Folks, A. Greenwood, 1934.

Idalium (Gr. *Idalion*). Ancient city of Cyprus, now represented by Dali. It stood in the valley of the Idalia, 13 m. S.E. of Nicosia. In the vicinity were a forest and temple sacred to Aphrodite, who was sometimes called Idalia. Inscriptions unearthed at Dali indicate that the Cypriote tongue was originally a Greek dialect.

Idar. Former state of India, now merged in Bombay. It lies E. of Baroda, S.W. of Mewar, covering about 1,905 sq. m. The ruler was a Rajput of the Rathod clan, his dynasty being an offshoot of the Marwar. Himmatnagar, the chief town, is 55 m. by rly. N.E. of Ahmadabad. Agriculture is the leading occupation, products being mangoes, sugar cane, oil-seeds, and cereals. Pop. 307,798.

Idas. In Greek legend, one of the Argonauts. Marpessa chose him for her husband in preference to Apollo, and the offended god attempted to abduct her, but was compelled to relinquish her to Idas, who pursued him with bow and arrows. Idas and his brother Lynceus had a famous fight with the twins Castor and Pollux, the quarrel having arisen about the division of some captured oxen. Idas killed Castor, but Lynceus was killed by Pollux; whereupon Zeus, the father of the twins, slew Idas with a thunderbolt.

Iddesleigh, STAFFORD HENRY NORTHCOTE, 1ST EARL OF (1818-87). British politician. Born in London, Oct. 27,



Stafford Northcote, 1st Earl of Iddesleigh

Oct. 27, 1818, of a Devon family, he was educated at Eton and Balliol College, Oxford. He became a barrister. and in 1843 private secretary to Gladstone. In 1851 he succeeded to the family baronetcy and estates, and in 1855 entered the house of commons as M.P. for Dudley. In 1866 he was president of the board of trade in

the Conservative cabinet, and next year secretary for India.

His party was out of power until 1874, when Northcote became chancellor of the exchequer. In this office he introduced the new sinking fund. In 1876, on Disraeli's transfer to the lords, he succeeded him as leader of the commons. He remained chancellor until 1880, and leader until 1885, when party differences resulted in his removal to the lords as earl of Iddesleigh. He was first lord of the treasury in 1885, and foreign secretary in 1886, but had just resigned when he died suddenly in Downing Street, Jan. 12, 1887. He wrote *Twenty Years of Financial Policy*, 1862. His *Life* was written by Andrew Lang, 1890. The title came in 1927 to Henry Stafford Northcote, 3rd earl (b. 1901).

Idea (Gr., form, kind, sort). Philosophical term introduced by Plato. According to him, the idea is the perfect eternal archetype, the original model of which individual objects are the imperfect images. He further assumed an idea for every class of existence—an idea not only of a table or chair, of virtue, but even of mere relation and quality. There are as many ideas as there are kinds of things, all controlled by the idea of the good. The two chief elements of the Platonic idea are the general notion and substantial, independent existence. The concepts, by which we think what we perceive by the senses, are general, unalterable, and consequently real.

In French and English philosophy, since Descartes and Locke, the meaning of the word has entirely altered. It is used for the representation of a thing in the mind, the notion formed by the subject of something else called the object, an act of reason as contrasted with an act of perception. There are two chief views as to the origin of ideas: that they are derived entirely, directly or indirectly from experience, without the assistance of reason; that the knowledge supplied by experience, being relative and contingent, has to be supplemented by reason. *See* Metaphysics; Philosophy.

Ideal Husband, AN. Comedy by Oscar Wilde, produced Jan. 3, 1895, at The Haymarket, where it ran for 119 continuous performances. Lewis Waller and Julia Neilson played the leading parts. A revival at Westminster Theatre, 1943, ran longer than the original production. A film version, by Sir A. Korda, appeared in 1947.

Idealism. Theoretical idealism, as contrasted with practical idealism, or striving after a standard of perfection, may be considered (1) as connected with the theory of knowledge, (2) metaphysically. Knowledge has to do with our own conceptions, never directly with the things of the external world in themselves. There can be no object without a subject.

The first who laid stress on this attitude was Descartes, who asked what right we had to believe that there existed external objects corresponding to our conceptions. Spinoza and Leibniz held that the mind drew knowledge from itself, although admitting that the reality corresponded to the internal ideas of the mind. Berkeley went further, declaring the universe to be nothing but a collection of mental perceptions, put before us by the supreme mind or spirit. Kant adopted a middle course—that external things were only phenomena (appearances) for the subject; that the possibility of knowing objects of experience was conditioned by space and time, whereby things are so altered that we do not know them as they really are, but only as they appear through those subjective media. (2) Metaphysical idealism holds that only intellectual principles are the really existent, not inanimate matter, and the blind forces of nature. See Hegel; Philosophy.

Identification (Lat. *idem*, the same; *facere*, to make). Term used in English law. Identification is often a matter of legal importance. The finger-print system has eliminated some of the risks of mistake of identity, but there is always the chance that an honest but unobservant person may mistake an innocent person for a guilty. When A has been arrested on suspicion of being a wanted criminal, and B is the person who saw the crime committed, it is usual for the police to collect a number of men in the prison yard together with A, and then to ask B to point out the man whom he saw commit the crime. Identity can be established, not only by swearing to his face, but to any physical peculiarity, to the voice, or even the clothes of the person to be identified. It is, however, always a question of fact; and no one ought to be convicted unless evidence of identity is so strong as to leave no reasonable doubt. See Finger-Print.

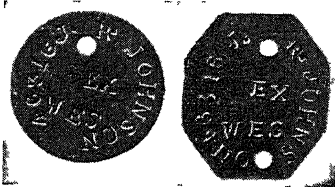
Identification. Psychological term for the merging of two persons in the mind; or in cases of

insanity, a person and a thing. Identifications are largely unconscious, but can sometimes be traced by the copying of mannerisms, voice, handwriting, etc. Identification lies behind such childish games as "playing fathers and mothers," and is the psychological basis of sympathetic magic. Danger is to be averted by assuming the powers and imitating the manifestations of the object or force which threatens, e.g. driving away thunder by the beating of drums. Identification differs from introjection (*q.v.*) in that the subject unconsciously considers himself to be the other person instead of merely adopting his values and beliefs. Where two persons other than oneself are unconsciously identified, the attributes and emotions proper to the one are transferred to the other: e.g. a good ruler may be identified with a loved father and receive loyalty and obedience.

Identity (Lat. *idem*, same). The condition of being the same and not something else. An indispensable first principle of reasoning is that everything remains identical with itself unless it is subjected to modification; this is expressed by $A=A$. Connected with this formula are the further principles that a thing cannot at one and the same time be itself and also something else; that it must be one thing or another; there can be no middle term between a thing and its opposite. Personal identity is the continuation of one's personality, the quality of the individual subject to remain the same. See Personality.

Identity Card. A certificate of identity issued to all British civilians on the outbreak of war in 1939 under the national registration scheme, and to all persons since born or coming to reside in the U.K. A police constable in uniform may require the production of the card either to him at the time or at a police station within two days. A national registration officer may require the production of a card at his office, and a member of the armed forces may require it from a suspected deserter or absentee. A person may be required to produce an identity card at a post office on opening a savings bank account or receiving any money or postal packet, or in any matter where evidence of identity is material.

Identity Disk. Means of identification worn by members of the fighting and civil defence services in wartime. Those issued to the



Identity Disk. Types issued to the British services in both Great Wars. Left, red; right, green

British forces during the Second Great War followed the pattern introduced in 1916. They consisted of two vulcanised fibre disks stamped with the wearer's number, name, and religious denomination. The disks were of two forms, green and octagonal, red and circular; the first was worn on a cord round the neck, and the second attached to it. If the wearer was killed, the green disk was buried with the body and the red detached and sent to higher authority as evidence of death. In the U.S.A. and Germany, the identity disk was of light metal and perforated; the lower half was broken off if the wearer became a casualty. Similar disks were issued by the Germans to prisoners of war in their hands. Many civilians voluntarily wore disks to establish their identity in the event of their being killed or injured in air raids.

Ides (Lat. *iduerē*, to divide). In the Roman calendar, the name of the 13th day of the month, except in March, May, July, and Oct., when the Ides fell on the 15th. See Calendar; Kalends.

Idiocy. Condition of extreme feeble-mindedness present at birth or in early childhood. The cause may be prenatal, the child springing from neuropathic stock. The most frequent causes at birth are prolonged labour or instrumental delivery, leading to injury to the brain. Sometimes the condition follows infantile convulsions. Various forms of idiocy, presenting different degrees of severity, are recognized. Idiots of the lowest type lead a more or less automatic life. They may be silent or utter meaningless cries, and have to be fed, dressed, and kept clean. Others acquire some degree of speech.

Imbecility is a term applied to degrees of feeble-mindedness above the lowest. If the mental age of an idiot is 3, that of an imbecile is 7, as assessed by intelligence test (*q.v.*). Idiots and imbeciles frequently show physical defects and deformities. Some are born blind, some suffer from short-sightedness, squint, and other ocular

defects. Deafness may be present. The stature is often small, the palate high, the forehead receding, and the head misshapen. The teeth are badly formed and signs of rickets are often present. The power of speech is slowly acquired, and may reach only a low standard. Stammering is frequent. Some idiots never learn to walk, others do not walk until much later than normal children, and then often in a clumsy manner. *See Mental Disorder.*

Idle. River of Nottinghamshire, England. Formed by the junction of the Maun and the Meden, it flows mainly N. from Sherwood Forest until it joins the Trent at W. Stockwith. Its length is about 40 m. In 617 a battle was fought on its banks between the kings of Bernicia and East Anglia. Ethelfrith of Bernicia was slain and his army routed.

Idle. District of Bradford, Yorkshire, England. Standing on the river Aire, it is 3 m. from the centre of the city, and has its own rly. station. A canal flows through it, and it is served by trolley-buses. Holy Trinity is the chief church. The manufacture of woollen goods is the principal industry. From a village Idle became a manufacturing centre, and in 1899 was included in Bradford (*q.v.*).

Ido. Universal language developed from Esperanto in 1907 by Couturat and de Beaufront. The name is an Esperanto word meaning offspring, and Ido is claimed to be Esperanto rendered more scientific and natural by the elimination of certain inflexions and rules of agreement. De Beaufront published a book on it in 1919. *See Esperanto*; *Universal Language*; *Volapük*.

Idocrase, or **VESUVIANITE**. A complex basic silicate of calcium and aluminium, with some replacement by iron, magnesium, etc. It occurs as brown or greenish tetragonal crystals or massive, sometimes resembling garnet, with which it is associated in impure metamorphosed limestones at Vesuvius and in Scotland. The compact green variety (californite) found in California resembles jade. Other varieties are viluite, egeran, cyprine, and colophonite. Idocrase has application as an ornamental or semi-precious gemstone.

Idolatry (Gr. *eidōlon*, idol; *latreia*, worship). Literally the worship of idols. In Judaism, Christianity, and Mahomedanism the word implies the worship of any but the Supreme Being, or the love or veneration of anything

that comes between the Supreme Being and the soul of man.

In the history of man idolatry has a place between animism or nature worship, ancestor worship, and belief in one true God. The idol was evolved when the first attempt was made to represent the unseen spirit by an image, and the virtues of that spirit were attributed to the representation or image. Animals and celestial bodies became objects of worship, and by degrees were represented in human or human-animal form. The sun-worshipper became the worshipper of Baal; the moon-worshipper the worshipper of Ashtoreth, both being represented by images or idols.

The references in the O.T. to false gods or idols are numerous, and reflect the early relations between the Semites and Babylonia. Before the law was given definite form in Deuteronomy the Israelites often relapsed into the practices of the forefathers of Abraham; they were surrounded by idolatrous peoples. The law, as finally delivered, made idolatry punishable by death. The word idolatry is used once in the O.T. (1 Sam. 15, v. 23), frequently in the N.T., where, and in the writings of the fathers, warnings are given against the worship of pagan gods under some kind of bodily representation. Later it was found that, just as the Jews worshipped idols in the belief that they were paying homage to Jehovah, so, if bodily representations of the Supreme Being were permitted, the Christian religion might be associated with idolatry.

This view is represented by the Puritan ideal. The R.C. Church defends the use of images partly because God Himself assumed human form in the person of Jesus Christ, partly because such images as that of Christ on the Cross help to bring vividly before the devout the meaning of their worship, and maintains that homage is paid not to the image but to the prototype. *See Animal Worship*; *Animism*; *Fetishism*; *Iconoclast*; *Image Worship*; *Religion*.

Idomeneus. In Greek legend, king of Crete and grandson of Minos. Caught in a storm on the return journey after the Trojan War, he vowed to sacrifice to Poseidon the first thing that met him if he reached home safely. The first person to greet him on the shore of Crete was his own son, whom he was therefore compelled to sacrifice. As a result, a plague descended upon the country, and Idomeneus was driven into exile by his people. *Pron.* I-dommy-nēuce.

Idria. Town of Yugoslavia, formerly in the Italian prov. of Gorizia. Standing on the river Idriza, 25 m. W. of Ljubljana, it is famous for its quicksilver mines, which have been worked since 1580, and formerly yielded some 500 tons of metal a year. The mine office is in the château of Gewerkenegg, built in 1527. Formerly in the Austrian prov. of Carniola, Idria became Italian after the First Great War, and was transferred to Yugoslavia by the peace treaty of 1947.

Idrian Process. One of the chief methods by which mercury or quicksilver is extracted from its ores, so called because it was first adopted at the famous quicksilver mines of Idria (*v.s.*). The heating of the ore is carried out in a central furnace, having a series of arches one above the other on which graded ore is piled, the coarse on the bottom and the fine on the top arch. The condensation is carried out in a series of brick chambers on each side of the furnace into which the gases from the furnace carrying the volatilised metal pass, and in which the metal condenses and collects. *See Mercury*.

Idris. Welsh legendary figure. His rough-hewn rocky seat on the summit of Cader Idris, Merionethshire, was said to inspire or drive mad any bard who spent a night on it. Mrs. Hemans used the legend in one of her poems. *See Cader Idris*.

Idro. Lake of Italy. It is in the prov. of Brescia, on the border of the Trentino. Situated between Lago d'Isèo on the W. and Lago di Garda on the E., 16 m. N. of Brescia, it is 7 m. in length from N. to S., 1½ m. wide, and 400 ft. in depth. The Chiese, an affluent of the Po, runs through it. The Romans called the lake Edrinus lacus.

Idumea or **EDOM**. In Biblical times, the high mountainous region lying S. of the Dead Sea. In Roman days Idumea formed the N. part of Arabia Petraea and the S. part of Judaea up to Hebron. The name means the red land.

Idun. In Scandinavian mythology, the goddess personifying spring, and the keeper of a box of golden apples from which the gods renewed their youth. When she was stolen by Thiassi, the winter god, and imprisoned in the nether world, the gods began to grow old without their apples, and planned her rescue. Restoring her to freedom in the spring, the gods again received the magic apples and grew young.

Idyll OR IDYL (Gr. *eidyllion*, little picture). This term generally denotes a short, descriptive pastoral poem, such as those of Bion, Moschus, and Theocritus in classical times. Tennyson gave a broader definition to the term in his *Idylls of the King* (*v.i.*).

Idylls of the King. A series of poems in blank verse by Lord Tennyson, the first of which was published in 1859. Mostly founded on Malory's *Morte d'Arthur*, they present in an imaginative and descriptive manner stories connected with King Arthur and his Round Table. There are further an introductory poem on *The Coming of Arthur*, and a closing one on *The Passing of Arthur*.

If. Small island in the Gulf of Lions, France. It lies 2 m. off Marseilles, and its castle, the



If, the Mediterranean island, and the château, long used as a prison, as described in *The Count of Monte Cristo*

château d'If, long used as a prison, was built by Francis I about 1530. It figures in Dumas' *Count of Monte Cristo*.

Ifley. Village of Oxfordshire, England. It stands on the left bank of the R. Thames, 2 miles S.S.E. of Oxford. There is a Norman church, S. Mary's, which has a famous doorway with rich chevron ornamentation and some interior features of interest. See *Gothic Architecture* illus.

Ifni. Small port on the coast of the Spanish Sahara. It lies on a creek 50 m. S.S.W. of Agadir. Ifni was ceded to Spain by Morocco in 1860, but was not effectively occupied until 1934. It has a carrying trade with the interior. Ifni territory includes 741 sq. m. with 35,000 inhabitants. Its S. boundary is the river Asaka.

Ifrit, IFREET, OR AFRIT. In Arabian folklore, a terrible demon malignant towards man, and appearing in a column of smoke.

Igarka. A river port of the U.S.S.R. In the Krasnoyarsk territory of Siberia, it is on the right bank of the Yenisei estuary. Its industry is timber sawing and shipping. Although it is within the Arctic Circle, work proceeds in winter with the aid of heating systems and floodlighting, except in a temperature below -85° F. Pop. 20,000.

Igharghar Wadi. Ancient river bed of the N. Sahara, N. Africa. It had its source in the plateau region of Hoggar or Ahaggar, in the N.-central Sahara, at an alt. of 6,000 ft., and flowed to the Shott Melhir, a depressed salt lake in the dept. of Constantine Algeria. Its waters have disappeared, and its whole course of 800 m. is now a boulder-strewn, sand-swept valley.

Iglesias. A city of Sardinia, Italy. Near the W. coast, it is 34 m. by rly. W. of Cagliari, in the centre of the Iglesiente, a lead and zinc mining region. Its Pisan-built walls, citadel, and towers are now dilapidated. It contains a cathedral, built in 1285, a beautiful episcopal palace, the remains of an Aragonese castle, several notable churches, and a school of mining. The mines employ many, and minerals are exported. Pop. 22,000.

Igloo. Snow house used between Nov. and March by the Eskimos of the Canadian mainland between Hudson Bay and Cape Parry and of the islands N. of Canada. It is built in dome form of snow blocks about 4 ins. thick; the inside of the wall is sometimes strengthened by raising it to melting point for half an hour and then allowing it to freeze again, so that a hard glaze of ice binds it together. See *Eskimo*.

Ignatius. Patriarch of Antioch and Apostolic Father. Nothing is known of his early days, though it is probable that he was a disciple of S. John. According to Eusebius, he was the second bishop of Antioch, after S. Peter, who is believed to have been bishop there before going to Rome. About 116 Ignatius was seized during the persecution under Trajan and taken to Rome to be thrown to the lions. On the journey he wrote the important Ignatian Epistles, which have been a fruitful subject of dispute among the critics. They are addressed to various churches, urge unity and obedience to bishops, and warn against Gnosticism and other errors. Consult *Saint Ignatius*, C. Hollis, 1931.

Ignatius, FATHER (1837-1908). Anglican preacher, whose real name

was Joseph Leycester Lyne. Born at Barking, Nov. 23, 1837, he was educated at S. Paul's and ordained in 1860. After serving as a curate he adopted the Benedictine



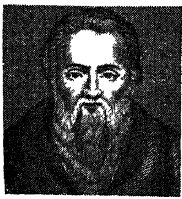
Father Ignatius, Anglican preacher
Elliot & Fry

habit and styled himself Father Ignatius. In 1870 he built Llanthony Abbey, among the mountains some miles from Abergavenny, as the home of an Anglican Benedictine order, but his eccentricities defeated his attempts to form a community. He was an eloquent preacher, whose mission services attracted large congregations both in Great Britain and in the U.S.A. His later years were largely spent in attacking the higher critics and the Broad Church party. He died Oct. 16, 1908.

Ignatius's Bean (*Strychnos ignatii*). Tree of the family Loganiaceae, native of the Philippines. The seeds are intensely bitter and contain a high percentage of strychnine, a strong poison. They are used in India as a cholera cure.

Igneous Rocks. (Lat. *ignis*, fire.) Rocks consolidated from molten material. They can be classified according, first, to their mode of occurrence: (1) extrusive, lavas which have been poured out on the land surface or sea floor from volcanoes; (2) hypabyssal, which have been injected while fluid into cracks and fissures, or form minor masses, at no great depths below the surface; (3) plutonic, which form large masses, and have cooled slowly, deep in the earth's crust. The three classes usually show characteristic variations in texture. Plutonic rocks are made up of interlocking crystals clearly visible to the naked eye. Hypabyssal rocks are similar, but of a finer grain; commonly isolated crystals of a particular mineral lie embedded in a finer mass, yielding a porphyritic texture. Extrusive rocks usually are finely crystalline; they may show a small-scale porphyritic texture, or may be chilled to solidify as a volcanic glass.

Igneous rocks are also classified according to their chemical composition. Rocks which have a 72-65 p.c. content of silica (SiO_2) are termed acid; intermediate rocks carry about 65-57 p.c.; basic rocks about 55-48 p.c.; and ultrabasic less than 45 p.c. SiO_2 . Thus acid rocks contain free quartz, and



Ignatius, Patriarch of Antioch

CLASSIFICATION OF COMMON IGNEOUS ROCKS

	ACID	INTER-MEDIATE	BASIC	ULTRABASIC
Per-centage of SiO ₂	72-65	65-56	55-48	45
EXTRUSIVE Lavas	<i>Rhyolite</i> <i>Feldsite</i> <i>Obsidian</i> Trachyte Pitchstone	Andesite	Basalt Olivine-Basalt	
HYPABYSSAL Dykes, Sills, etc.	<i>Quartz Porphyry</i> <i>Aplite</i> <i>Pegmatite</i> Porphyry	Porphyrite	<i>Tholeiite</i> Dolerite Olivine-Dolerite	
PLUTONIC Deep Seated Masses	Granite Syenite	Granodiorite Diorite	Gabbro Norite Olivine Gabbro	Peridotite Serpentine Pyroxenite Hornblendite Dunite
Main Mineral Constituents	Quartz Muscovite Biotite OrthoclaseFeldspar and Albite	Hornblende Plagioclase Andesine to Labradorite	Puroxene Feldspar Andesine to Labradorite	Olivine No Feldspar

NOTE.—Italics indicate rocks which are so rich in silica that they contain free quartz.

basic or ultrabasic are composed largely of iron oxides, pyroxene, and/or olivine, poor in silica and rich in iron, calcium, and magnesium. Acid rocks likewise carry high percentages of potash and soda when compared with basic. They are also lighter in weight and colour.

Less common varieties of igneous rocks are the alkaline or feldspathoidal groups, which contain an excess of alkali (potash or soda) or are deficient in silica compared with the other constituents. The compositions of these rocks are such that the usual minerals are not produced, less common varieties—leucite, nepheline, aegirine, etc.—taking their places. See *Geology; Rock; consult* *Igneous Rocks and the Depths of the Earth*, R. A. Daly, 1933.

Gilbert Wilson, Ph.D.

Ignis Fatuus (Lat., foolish fire). Flickering flame due to marsh gas, sometimes seen floating over marshes and in places where there is decaying animal matter. The phenomenon has given rise to many superstitions, and is known by several other names, e.g. Will-o'-the-wisp and Jack-o'-Lantern.

Igniter. Small charge of gunpowder placed in a cartridge, which conveys the flash from firing tube or primer to the cordite. In Q.F. cartridges, which contain the charge in a brass case furnished

with a primer, the igniter sometimes consists of a small cylinder of cordite sewn to a shalloon bag of gunpowder. In B.L. cartridges the igniter is enclosed in a silk or shalloon bag sewn into the end of the cartridge (*q.v.*).

Ignition. Act of setting on fire, or being made incandescent by heat. Generally ignition is accompanied or followed by combustion, as when a candle is lighted; but a rod of platinum or a piece of porcelain or a cylinder of prepared lime, as used in limelight lantern apparatus, may be raised to incandescence without combustion taking place. The word is also used for the firing of the combustible mixtures at the proper time in an internal combustion engine.

Ignorance. Lack of knowledge of fact or law. In law it is held that *Ignorantia juris neminem excusat* (Ignorance of the law excuses no one), which may be stated positively: "Everyone is supposed to

know the law." The maxim is justified by the fact that conditions would be impossible if every law-breaker were allowed to excuse himself by the plea that he did not know he was breaking the law of the land. Ignorance of law is no defence in criminal cases, but in some cases it may be claimed to mitigate the seriousness of an offence.

Igorot. Primitive people of Indonesian stock in N. Luzon, Philippine Islands. Numbering perhaps 200,000, mostly in the mountainous provinces, they cultivate rice with digging-sticks on terraces with rough stone embankments. There are bachelor and spinster houses, and family dwellings. They were formerly head-hunters.



Igorot. Man of this primitive Philippine people

Igualada. Town of Spain, in the prov. of Barcelona. It stands on the river Noya, about 25 m. by rly. N.W. of Barcelona, in a fertile district, surrounded by vineyards, producing excellent wine, and is the terminus of a rly. line to Barcelona. Manufactures include textiles, leather, soap, chocolate, and firearms. Pop. 13,968.

Iguana. Family of large lizards, found in the tropical regions of America and including about 300 species. The best known is *I. tuberculata*, about 5 ft. long, with a kind of fringe on its back and a very prominent dewlap. It is found in Central and S. America, and in the W. Indies, and spends most of its time in the trees. In colour greenish, with brown bands and bars, it is a fine swimmer and diver. It feeds mainly on fruits and leaves, and is quite inoffensive, though it can bite savagely if cornered, and can inflict severe blows with its tail. Its flesh is white and delicate, and in Mexico both it and its eggs are in demand. See *Lizard*.



Iguana. The large tropical American lizard, *Iguana tuberculata*

Iguanodon. Fossil land reptile, belonging to the Dinosaurs, found in the Jurassic and lower Cretaceous rocks of Europe. The first bones were found by Mantell in limestones of Tilgate Forest, and others were found in Belgium, 1878. In 1921 the footprint of one of these monsters was discovered at Glyne Gap, Bexhill. From these remains the iguanodon appeared to have been 15 to 25 ft. long, with a small head, heavy jaws set with teeth like the modern iguana, and strong flexible lips. The animal, an herbivorous feeder, supported itself on its two hind legs and powerful tail, its front limbs being comparatively small. These fore limbs were provided with four toes and a bony spur, the use of which is unknown. The hind legs were three-toed. The animal inhabited swampy regions of England and the Continent, and from the remains must have existed in large numbers. *See* Dinosaur.

Iguassu or **Iguazu.** River of Brazil. In the state of Paraná, it flows W. to join the Alto Paraná at the frontiers of Brazil, Paraguay, and the Misiones territory of Argentina. It is famous for its cataracts, on the Argentine side, which are 40 ft. higher than those of Niagara and half as wide again. They are set in virgin forest, bright with multicoloured birds and butterflies, and festooned with creepers and orchids. Small steamers ply from Posadas nearly to the falls. Iguassu was the name of a strip of country facing Misiones, placed under direct presidential rule 1943-46.

Iguvium. City of Umbria, in ancient Italy, on the Flaminian Way. It was one of the first towns occupied by Julius Caesar after crossing the Rubicon. The modern Gubbio, it is famous for the seven bronze tablets discovered by a peasant in a ruined temple of Jupiter Apenninus, containing an important contribution to a knowledge of the Umbrian language. *See* Etruscan Tablets; Gubbio.

I.H.S. Monogram used in Christian worship from early times. Placed within a circle of rays, it is a device of the Society of Jesus. Probably it represents the first three letters of the Greek *IHCOC* (Jesus), with the third letter Latinised. Variant forms are IC, IH, IHC, JHS. Alternatively, it is explained as the initials of the Latin words, *Jesus Hominum Salvator*, Jesus



I.H.S., the Christian monogram

as the initials of the Latin words, *Jesus Hominum Salvator*, Jesus

the Saviour of Men, or *In Hoc Signo (vinces)*. In this sign (thou shalt conquer), said to have been seen by the Roman Emperor Constantine on the radiant cross that appeared to him in the sky on the occasion of his setting out to fight Maxentius. Other interpretations are: I Have Suffered; Jesus, Heavenly Saviour. A German rendering is *Jesus Heiland*, *Seligmacher* (Jesus, Saviour, Sanctifier). An early example of the form IHC is on a gold coin of Basilus I, in the 9th century. *See* Labarum; Monogram; Tetragrammaton.

Ijmuiden or **Ymuiden.** Town of the Netherlands, in the prov. of N. Holland. It is situated at the W. end of the North Sea Canal behind the dunes, 15 m. W. by N. of Amsterdam. Near are locks which protect the canal when the tide is at the flood. Quays and other shipping facilities make the place a growing outport for Amsterdam. The fishery is valuable, and there are ice and chemical works. When German forces were overrunning the Netherlands in 1940, steps were taken to deny them the use of the port. Two vessels were sunk at the S. entrance, and dock installations and lock machinery were destroyed. The port was subsequently raided by Allied air forces, but the Germans occupied it until 1945.

Ijsselmeer. Lake of the Netherlands, remaining from the former Zuider Zee, also spelt Ysselmeer.

Iki. Small island of Japan, off the N.W. coast of Kyushu. It is separated from the Tsushima Islands in the strait of Korea by Tsushima Channel, and from the shores of the prov. of Saga on Kyushu by the Iki strait. It is 30 m. N.W. of Fukuoka, and there is good anchorage at Gonoura, the capital, on the S.W. coast. The chief products are grains and beans. The area of the island is 53 sq. m., and pop. 40,200.

II. An administrative unit of Turkey, also called vilayet. *See* Vilayet.

Ilawa. Polish name of a town of Masuria described under its German name Deutsch Eylau. *See* under Eylau.

Ilchester. Village and parish of Somerset, England. It stands on the Ivel or Yeo river and on the Fosse Way, 5 m. N.W. of Yeovil. The chief building is the 13th century church of S. Mary Major. There are a market cross, remains of the county gaol, and early earthworks. Ilchester was an inhabited place in pre-Roman

times. Roman antiquities are dug up every year. A royal mint was established in Edgar's reign (959-975). In 1086 Ilchester was a royal borough with 107 burgesses; it withstood a siege by William of Mowbray in 1088. It had a king's gaol from before 1166 to 1843. Henry II granted a charter which gave it the same liberties as Winchester. There were a Dominican friary, Augustinian nunnery, and lepers' hospital here.

Until the 19th century Ilchester was the centre of the co. administration. From 1298 to 1832, with occasional breaks, it returned two M.P.s, among them Sheridan and Selden. The endowment of an almshouse founded in 1426 is used today for the relief of the poor. Ilchester was the birthplace of Roger Bacon and Elizabeth Rowe, the poet. Pop. approx. 700.

Ilchester, EARL OF. Title borne since 1756 by the family of Fox-Strangways. In 1741 Stephen Fox (1704-76), a Dorset M.P., was made Baron Ilchester, and in 1756 was created an earl, Ilchester being the name of his Somerset estate. He was a son of Sir Stephen Fox (1627-1716) and brother of Lord Holland, and he took the additional name of Strangways. The earl's eldest son is called Lord Stavordale. Giles, 6th earl, was born May 31, 1874, and succeeded to the title in 1905.

Île de France. Name given to a district in old France, the nucleus of the kingdom. It lay around Paris, and was an island in the sense that its boundaries were mainly rivers. From their home in the island the early kings enlarged their territory, until its old significance was lost. Later, and until the Revolution, the Île was one of the country's provinces or governments. Larger than the original island, it lay between Normandy, Picardy, Champagne, and Orléanais. It is now covered by the departments of Seine, Seine-et-Oise, Seine-et-Marne, Oise, and Aisne.

Île de France. Old name of Mauritius. Discovered by the Portuguese navigator Pedro Mascarenhas, in 1505, it was settled by the Dutch, who renamed the island in 1598. But it was afterwards colonised and held by the French from 1715 until its capture by the British in 1810. *See* Mauritius.

Ilets. Town of the U.S.S.R. It is in the Chkalov region, 40 m. by rly. S. of Chkalov, and is famous for its salt-beds.

Ileum (Lat. *ilia*, groin). Lower three-fifths of the small intestine, about 14 ft. in length. It is a con-

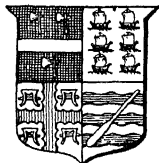
tinuation of the jejunum, and terminates in the caecum or commencement of the large intestine.

Ilex. Genus of about 145 species of shrubs and trees of the family Aquifoliaceae. Natives of temperate and tropical regions, they have alternate, undivided leaves, often of a leathery or evergreen character, and small flowers clustered in the axils of the leaves. The common holly (*q.v.*) is the best known species in the old world, but in S. America the most important is *Ilex paraguayensis*, which yields maté (*q.v.*). The word is often applied to the evergreen oak (*Quercus*) *ilex*, the original *ilex* of Virgil and the Romans.

Ilford. Borough of Essex, England. It lies E. of the Roding, 7½ m. by electrified rly. E. of the Liverpool Street terminus, and has underground rly., Green Line, trolley-bus, and bus services to London. An international airport at Fairlop is planned. The district includes Aldborough Hatch, Barkingside, Goodmayes, Newbury Park, Seven Kings, Chadwell Heath, and part of the L.C.C. Becontree estate. There are thirteen parks and recreation grounds, and Hainault Forest lies within easy reach.

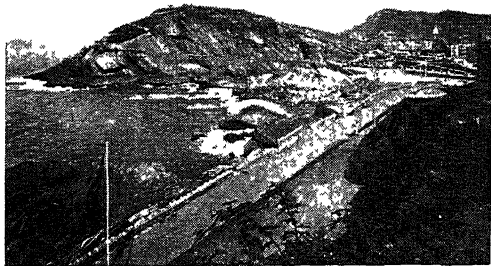
Since 1939 the town has developed industrially but without encroachment on residential areas. Paper, photographic material, electric lamps, radio components, and precision instruments are local manufactures. There are a modern hospital, isolation hospital, maternity home, and clinics and nurseries. Two M.P.s are returned. Among the churches, S. Mary's dates from 1830, others being newer. Of 46,631 houses, over 45,000 were damaged by enemy action in the Second Great War. The pop. in 1876 was 3,689; it was estimated in 1949 at 179,820.

Ilfracombe. Seaport, market town, and urban district of Devon, England. On the S. shore of the Bristol Channel, 12 m. N.N.W. of Barnstaple, it is 226½ m. by rly. from London (Waterloo). Its harbour offers safe anchorage to small craft.



Ilfracombe arms

and from the pier sail pleasure steamers to Lundy, Bristol, and S. Wales. As a seaport it was more significant in bygone days; in 1346 it furnished six ships and 96 men



Ilfracombe, Devon. Capstone Hill from the west. Top right, the town and harbour from Hillsborough

for the siege of Calais. The anti-quarian now must turn to the old parish church of Holy Trinity, or to the lighthouse on Lantern Hill, once the chapel of S. Nicholas. During the 19th century Ilfracombe became recognized as a health resort; and its increasing popularity can be attributed also to a district of magnificent scenery. The rugged coast offers bathing coves, and within easy reach lie Exmoor and Dartmoor. Market days, Wed. and Sat. Pop. 10,000.

Ilhavo. Harbour of Portugal, in the dist. of Aveiro. It stands on a lagoon, 3 m. S.W. of Aveiro. A fishing port, it exports much salt, but it is chiefly noted for glass and porcelain ware. Traditionally founded by the Greeks, Ilhavo is renowned for the beauty of its women. Pop. 12,700.

Ilheus. Seaport of Brazil, 120 m. S. of the city of Bahia, and in that province. It handles two-thirds of the cacao crop of Brazil and has direct steamer communication with the U.S.A. Pop. of port and district, approx. 50,000.

Ili. River of Central Asia, partly in Sinkiang, China, and partly in the Kazakh S.S.R. Under the name of Tekes, it rises in the Tian-Shan Mts., and flows N.E. till it is joined by the Kungez and Khashi, when it becomes known as Ili. Bending sharply W., it crosses the Russo-Chinese frontier, and at Ilisk turns N.W., to fall into Lake Balkhash after a course of 950 m.

Ilia. In Roman legend, another name for Rhea Silvia. She was the vestal virgin who became by Mars the mother of Romulus and Remus. See Rhea Silvia.

Iliad, THE. Greek epic poem ascribed to Homer. In 24 books, it deals with a phase of the tenth year of the Greeks' siege of Ilion or Troy. The central incident is the wrath of the hero Achilles. Agamemnon, the leader of the besieging Achaean host, has seized the Trojan maiden Chryseis, the daughter of a priest of Apollo. The god thereupon has sent a plague, which the soothsayer Calchas declares can be stayed only by the restoration of Chryseis to her father. Agamemnon consents, but by way of compensation threatens to deprive Achilles of the captive maid Briseis. Achilles thereupon retires to his tent.

At the entreaty of Thetis, mother of Achilles, Zeus inclines the scales of victory in favour of the Trojans until Hector has stormed the ramparts and Agamemnon promises atonement. Even then Achilles refuses to take an active part in the struggle, but allows his friend Patroclus, equipped in his armour, to take his place. Patroclus is slain by Hector, whereupon Achilles leaves his tent and avenges the death of his friend. The poem concludes with the funeral games in honour of Patroclus and the ransoming of the body of Hector by his father Priam. See Achilles; Homer.

Iliamna. Lake and volcano of Alaska, U.S.A. The lake, largest in Alaska, is 75 m. long and up to 25 m. wide, lies across the head of the Alaska Peninsula, and empties its waters into Bristol Bay via the Kwichpak river. It abounds in trout. The volcano, situated near the shore to the W. of Cook Inlet, and reaching an elevation of 10,085 feet, is occasionally active.

Iliffe, EDWARD MAUGER ILIFFE, 1st BARON (b. 1877). British newspaper proprietor. The son of William Iliffe, J.P., Allesley, Warwickshire, he was born May 17, 1877. He founded a publishing house with *The Cyclist*, in 1881. This journal and a later venture, *The Bicycling News*, which had the distinction in 1888 of employing on its staff Alfred Harmsworth, afterwards Lord Northcliffe, may be regarded as the pioneers of the

many periodicals which have since come into being with the expansion of first the cycling and later the motoring industry.

In due course Edward Iliffe, together with his brother, W. Coker Iliffe, entered the paternal business. The



1st Baron Iliffe,
British newspaper
proprietor

foresight of William Iliffe and the energy and enterprise of his sons, in building up and maintaining a body of journalism unique in the world and in every way worthy of the British industries with which it was connected, were responsible for the great success of the well-known group of high-class technical journals which are now associated with the name of Iliffe. The firm also established in 1891 the Midland Daily Telegraph (later the Coventry Evening Telegraph), whose successful career is a reflection of the rapid growth of the Coventry industries.

After the death of their father the control of the business passed into the hands of his two sons in 1917. Under their able direction the publishing house of Iliffe & Sons, of London and Coventry, expanded steadily. Modern methods and acute anticipation of modern needs ensured its success, and in its London offices at Dorset House, Stamford St., S.E.1, it possesses one of the finest newspaper buildings in the metropolis.

Not content with the continuous and increasing success of the numerous technical journals under his control, Edward Iliffe entered into association with William and Gomer Berry (later Lord Camrose and Lord Kemsley) in various large newspaper enterprises, and eventually became with them a joint proprietor of the Daily Telegraph, a director of Allied (now Kemsley) Newspapers, Ltd., an organization which controls no fewer than 23 national, provincial, and Scottish newspapers; a director of the Amalgamated Press, Ltd., originally founded by Northcliffe; and of various other publishing enterprises. Most of these interests were eventually relinquished as the result of new dispositions at the instance of Lord Camrose, which are more fully explained under the entry Camrose. But in friendly separation from these important journalistic ties, Iliffe had other schemes for independent action,

and in 1944 he acquired the control of the Birmingham Daily Post, and its associate journals the Weekly Post and Birmingham Daily Mail. To this important provincial group and the Coventry Evening Telegraph his interest in journalism was later confined.

But Iliffe showed himself a man of many interests, particularly in the insurance world, though his chief activities apart from those mentioned long lay quite outside his commercial or professional life. His public services, and particularly his war work under the aegis of the Red Cross, in both Great Wars are too numerous to tabulate. But it may be noted that among the many public positions he filled with distinction are those of president of the Association of British Chambers of Commerce (1932), president of the trustees of the Shakespeare memorial theatre, Stratford-on-Avon, president of the Queen Elizabeth hospital for children, president of the Periodical Proprietors' Association (1935-38), and master of the Worshipful Company of Stationers and Newspaper Makers (1937). For his many public services he was knighted 1922, and received the G.B.E., 1946. In 1923 he was elected Unionist M.P. for Tamworth, and retained the seat until 1929. He was raised to the peerage as Baron Iliffe of Yattendon in 1933. He married in 1902 Charlotte Gilding. His heir, Edward Langton Iliffe, was born in 1908.

J. A. Hammerton

Ilissus. Small river in Attica, Greece. It rises in Mt. Hymettus, flows S. past Athens, and after joining the Cephissus discharges itself into the Bay of Phalerum. In summer its stream is always dry. Ilissus and its surroundings are charmingly described in Plato's dialogue Phaedrus.

Ilithyia (Greek *Eileithyia*). In Greek mythology, the goddess who assisted women in childbirth. She was the daughter of Hera, with whom, as with Artemis, she was often identified.

Ilium. The classical name for the ancient Greek city, in N.W. Asia Minor, which is more usually known as Troy (*q.v.*).

Ilk. Old Scottish or English word meaning "same," chiefly used in the phrase "of that ilk" as the territorial designation of Scottish landed families, where the surname and the name of the land are identical, *e.g.* Guthrie of that ilk.

Ilkeston. Mun. borough and market town of Derbyshire, England. It is 9 m. N.E. of Derby and 7 m. N.W. of Nottingham, and is served by two railway lines. The river Erewash, a county boundary, runs by it, as does a canal. The chief building is the fine old church of S. Mary, partly Norman. Ilkeston is mentioned in Domesday, but was a small place until the 19th century, when the development of the coalfield made it a manufacturing centre. Besides mining, the chief industries are ironworks and the making of hosiery and lace. It was made a mun. borough 1887. Pop. 32,813.

Ilkley. Urb. district and inland watering-place of the W. Riding of Yorkshire, England. It stands



Ilkley arms

on the Wharfe, 12 m. N.N.W. of Bradford, and has a railways station (N.E. region). The chief church is All Saints, an old edifice restored; there are three Saxon crosses in the churchyard. The town has some mineral springs. There are a grammar school and museum, public library, town hall and public offices, also



Ilkley. The Cow Rock, one of the great crags high on the moors S.E. of Ilkley, seen in the background

a number of hydropathic establishments. The urban district council owns the water supply and has acquired Ikley Moor, consisting of 2,000 acres of moorland. Near is Ben Rhydding, also with hydropathies. Ikley was a Roman settlement, Roman remains having been found. Pop. 17,500.

Illahun OR **ELLAHUN**. Village in the Fayum, Upper Egypt, 12 m. S.E. of Medinet. In the vicinity is a mud-brick pyramid, once limestone-cased, on a natural rock foundation, identified by Petrie in 1889 as that of Senusert II of the XII dynasty. The workmen's dwellings at Kahun were also unearthed. A Coptic cemetery of about A.D. 600 yielded important embroideries and woven stuffs, the finest being in the Victoria and Albert Museum, London. In 1920 Petrie found in the pyramid the gold serpent from the royal crown, and in the vicinity predynastic graves, besides Palaeolithic implements of Mousterian style.

Illampu. Peak of Bolivia. In the Eastern Cordillera or Cordillera Real, it is in the dept. of La Paz, 60 m. N.N.W. of La Paz, and E. of Lake Titicaca. The mountain, variously known as Illampu or Sorata, has two summits, of which the heights, 21,490 ft. and 21,275 ft. respectively, were determined by Sir Martin Conway, who climbed almost to the higher in 1898. *See* Andes.

Illawarra. A district of New South Wales, Australia. It comprises the coastal strip between the mountains S. of Sydney and the Pacific, and is noted for its scenery. Rich in steam coal, it is an industrial centre making iron and steel goods. A productive dairying district, it supplies Sydney with milk, by a coast rly. which has its terminus on the S. shore of Illawarra Lake, a noted arm of the sea. Pop. 68,150.

Illecebraceae. A family of small tufted annual and perennial herbs. They are natives of warm, dry regions. They have alternate, or opposite, undivided leaves and flowers in small clusters. There are four or five sepals, which persist and cover the fruit, and the petals are either very small or entirely lacking. The fruit is a bladder, enclosing a single seed.

Ille-et-Vilaine. Department of France, forming part of Brittany. It stretches along the English Channel, Dinard, St. Malo, and other pleasure resorts being herein, while off its coast is Mont St. Michel. The dept., whose area is

2,679 sq. m., is fairly level. Its chief rivers, in addition to those from which it receives its name, are the Seiche, Meu, and Rance. There are a number of small lakes. It is an agricultural region. Some of the inhabitants are engaged in fishing, some in mining. Rennes is the capital. Pop. 578,246.

Illegitimacy (Lat. *illegitimus*, not in accordance with law). Condition of one born out of matrimony, *i.e.* bastardy. By English law such children are illegitimate as are not born either in lawful wedlock or within a competent time after its determination, *e.g.* within such a time after a husband's death that it was not impossible for him to be the father of the child. Further, even though born in wedlock, a child may be illegitimate if the husband can be shown to have been deprived of access to his wife for above nine months before its birth. When a voidable marriage is declared null any children born of the marriage are legitimate.

The maintenance of an illegitimate child is the legal obligation of the mother. She can obtain a summons for the alleged father to appear at petty sessions to show cause why he should not contribute to its support, and if satisfied by her evidence, corroborated in some material particular, the justices may make an order on such putative father for the payment of a weekly sum not exceeding 20s. until the child attains a specified age up to sixteen, or dies. The order ceases to have effect on the making of an adoption order, unless the mother is the adopter; it then ends on her marriage. The application for the order may be made by a local authority where the child is in their care or in an approved school managed by them or to which they contribute, or by the national assistance board where assistance is given to the child by them.

Illegitimate persons are subject to legal disabilities in the law of succession. They are *nullius filii*, sons of nobody, and with one exception cannot succeed to the property of their parents on intestacy nor through their parents to the property of any relative of their parents. Likewise, with a similar exception, their parents and parents' relatives have no right to succeed to the property of the illegitimate should he die intestate. The first exception is that when the mother of an illegitimate child has died since Jan. 1, 1927, wholly or partly

intestate, and leaving no legitimate issue, then the illegitimate child or, if he is dead, his issue may succeed to her property. Similarly, the mother of an illegitimate child who has died intestate after Jan. 1, 1927, without legitimate issue is entitled to succeed to his property subject to the claims of any surviving husband or wife of the illegitimate.

By the Legitimacy Act, 1926, illegitimate children may in some circumstances be made legitimate by the subsequent marriage of the parents. *See* Legitimacy.

Iller. River of Bavaria, Germany. Rising in the Alps in Tirol, it flows mainly N. until it falls into the Danube near Ulm. It forms for some distance the boundary between Württemberg and Bavaria. Its length is about 100 m.

Illimani. Volcanic mountain mass of the Andes. It is in Bolivia, about 26 m. S.E. of La Paz. One of the loftiest summits in the republic, with four main peaks, it is perpetually snow-covered above 15,000 ft. It carries glaciers and a lake at an alt. of nearly 16,000 ft. One of the minor peaks was first ascended in 1877, and the highest was scaled by Sir Martin Conway in 1898. Its alt. is 21,200 ft.

Illingworth, ALBERT HOLDEN ILLINGWORTH, BARON (1865-1942). British politician. Born May 25, 1865, he was educated at the London International College, and made an outstandingly successful business career in Bradford. He entered parliament as Liberal M.P. for Heywood, 1915-18, and represented Heywood and Radcliffe, 1918-21. Postmaster-general in the Coalition ministries from 1916, he resigned on being raised to the peerage in 1921. He joined the Conservatives in 1930. Director of several companies, he died Jan. 23, 1942.

Illinium OR **FLORENTINUM**. A chemical element. Its atomic number is 61, and its discovery was claimed by Smith Hopkins of Illinois in 1926. It has the atomic weight of 147 and its spectrum was observed in an investigation of the rare elements neodymium and samarium. Other chemists, including Rolla and Fernandes of Florence, claim to have noticed the spectroscopic evidence. Illinium occurs in minute traces in monazite and other minerals. *Consult* Annual Reports of the Chemical Society, 1936.

Illinois. River of the U.S.A. Formed by the union of the Kankakee and Des Plaines rivers

in the N.E. of Illinois state, it flows W. and then abruptly S. to the Mississippi about 20 m. above the latter's confluence with the Missouri. About 273 m. long, it is part of the Illinois Waterway, a 327-mile cross-state system of canals and natural waterways connecting Lake Michigan and the Mississippi. Tributaries include the Sangamon, Vermilion, Fox, and Spoon. The drainage basin is about 24,726 sq. m. *

Illinois. North-central state of the U.S.A., the 23rd in size. It lies to the S.W. of Lake Michigan, which forms part of its eastern boundary. The area of 56,400 sq. m. is almost surrounded by water, nearly three-quarters of its boundaries being navigable rivers. The largest rivers are the Mississippi, extending along the western boundary, its tributary the Illinois, which flows wholly within the state, draining 24,726 sq. m., and the Wabash and the Ohio, on the E. and S. borders respectively. Altogether, Illinois has 4,000 miles of navigable rivers supplemented and coordinated by the Illinois Waterway. This 327 m. canal system, extending from Chicago to Grafton, links Lake Michigan with the Mississippi and includes the Chicago river, the Chicago Ship Canal, and parts of the Des Plaines and Illinois rivers. The state is virtually level throughout and experiences extremes of temperature.

Illinois is extremely fertile and ranks as the fourth richest agricultural state. Principal crops are wheat, oats, barley, rye, potatoes, hay; fruit, nuts, and wool are also produced. With Chicago leading the world in slaughtering and meat-packing, Illinois has long ranked first in this industry. It is the fifth largest producer of minerals in the U.S.A., coal deposits underlying half the state; there are also found iron, oil, natural gas, lead, zinc, stone, gravel, and cement. Secondary industries are steel and iron products, railway and motor vehicle works, oil refineries, printing and publishing, the manufacture of agricultural and electrical machinery, men's clothing, and wood and leather goods.

Thirty-three major trunk lines enter Chicago, which is the largest rly. terminus in the world, and the state has 11,758 m. of track. There are 83 airports.

The capital is Springfield, but the principal city is Chicago. There are 58 other cities with pop. over 10,000. Seventy-three

per cent of the pop. is urban. Education is provided by the universities of Illinois, Chicago, Loyola, and Evanston, and there are several state teachers' and other colleges. Illinois originally formed part of Indiana Territory, at one time part of Canada. An organized territory by 1809, it was admitted to the Union in 1818. Two senators and 26 representatives are returned to congress. Illinois is traditionally Democratic in the large cities, but Republican in rural areas. Pop. 7,897,241, the third state. *Pron.* Illinoy or Illinoyz. *Consult* The Centennial History of Illinois, ed. C. W. Alford, 6 vols., 1920.

Illuminati (Lat., enlightened). Name applied to several sects and schools of thought. The first arose in Spain in the 16th century, through the teaching of a Carmelite nun. They rejected the Sacraments, holding that spiritual perfection could be attained by meditation, that good works were unnecessary, and that they were incapable of sinning. The sect was cruelly suppressed by the Inquisition. In 1634 another sect, called Guérinets from their leader Pierre Guérin, arose in Picardy. He taught a kind of perfectionism which virtually amounted to the deification of its followers, and naturally led to antinomianism. The movement was suppressed by Louis XIII. In 1776 the name was assumed by a party of atheists at Ingolstadt, under the leadership of Adam Weishaupt (1748-1830), a professor in the university. They sought to introduce free-thinking republicanism under the guise of toleration and social reform, and organized a sort of freemasonry with this object. They were suppressed by the Bavarian government in 1785.

Illumination. A term in physics which might be defined as the amount of light falling on a surface. The idea of an "amount of light," however, presents difficulties, since the eye can make only very poor quantitative judgements. Moreover, its impression of more or less light does not correspond to physical measurements of the amount of energy present in any given radiation. But the eye can tell with fair consistency when two adjacent similar surfaces seem to it equally lit, and on this form of judgement all measurements of light are ultimately based.

A unit of luminous intensity was first defined by the (London) Metropolis Gas Act of 1860 as

the intensity (in a horizontal direction) of a "standard candle" of spermaceti weighing $\frac{1}{4}$ lb. and burning 120 grains per hour. In 1909 an "international candle" was agreed, and defined by reference to specially constructed electric lamps deposited in the various national laboratories. The candle-power of a source is found by noting the distance at which it produces the same illumination as a standard source at known distance (see Photometry).

Luminous flux is defined as the rate of flow of radiant energy reckoned according to its power to produce the sensation of light. The unit is the lumen, equal to the rate of flow of luminous energy from a uniform point source of one candle within unit solid angle; i.e. if the source is at the centre of an imaginary sphere of unit radius, one lumen of luminous flux will flow continuously through each square unit of the surface of the sphere, and the source (1 candle) will emit 4π lumen.

Illumination is the amount of luminous flux falling on unit area of a given surface. The units are: the metre-candle or lux, equal to one lumen per sq. metre, i.e. the illumination of a (spherical) surface one metre distant from a uniform point source of one candle; the phot, equal to one lumen per sq. cm.; and the foot-candle, equal to one lumen per sq. ft., or 10.76 lux.

An illuminated surface (e.g. a sheet of paper) gives off light by reflection, and in this respect is equivalent to an extended source (e.g. a ground glass screen lit from behind). The brightness of a surface is the amount of luminous flux emitted or reflected per unit area, and for a perfectly diffusing surface appears the same from all directions. Units are: the lambert, giving one lumen per sq. cm. (a brightness of one lambert is thus equivalent to an extended source with an intensity of $1/\pi$ candle for every sq. cm. of area); the stilb, equivalent to 1 candle per sq. cm. (so that 1 stilb = π lambert); the apostilb giving one lumen per sq. metre (so that 1 lambert = 10^4 apostilb); and the foot-lambert giving one lumen per sq. ft.

Illumination. Decoration of written text with coloured pictures or designs, chiefly on manuscripts. Painted books were the immediate precursors of printed books. They were works of art, and being portable, their preservation was easy.

Hence extant examples retain pristine vividness of colouring and sharpness of definition. Their vogue lasted from the 9th to the 16th century, though some, *e.g.* the celebrated version of the Gospels produced at Kells, now in Trinity College, Dublin, were written and ornamented some centuries earlier. The illuminators were either professional artists or scholarly monks who had made a special study of miniature painting and decoration.

The Western countries of Europe furnished brilliant specimens, each nation having its own characteristics. The MSS. most commonly illuminated were Bibles, Gospels, Psalters, Missals, Breviaries, Books of Hours, and manuals of devotion, and, less generally, Bestiaries, certain of the Latin and Italian classics, and works of a religious and theological character. The most famous of the English schools included Winchester, Hereford, Salisbury, Durham, Canterbury, York, E. Anglia, and other monastic centres. William Morris wrote some MSS. of remarkable beauty. See Bible; Manuscripts; Writing.

Illusion (Lat. *illudere*, to trick, cheat). Erroneous interpretation of something really existent and actually perceived by the senses. It is distinguished from hallucination in which a person subjectively perceives what has no real existence so far as his sense perceptions are concerned. Some illusions arise from imperfect knowledge or perception, as when a person is deceived by the tricks of a conjurer. Others arise from a disordered condition of the senses, as when an intoxicated man sees two objects where one exists.

Illustrated London News, **THE**. Oldest pictorial newspaper in the world. A weekly, it first appeared May 14, 1842, containing 16 pp. with 32 woodcuts, price sixpence, and, until The Graphic was founded in 1869, was without a serious rival. Its founder, Herbert Ingram (*q.v.*), Nottingham printer and bookseller, aimed at making the news interesting in the home. By 1851, when an edition was printed in the Great Exhibition, it had a circulation of 130,000. In 1855 its Christmas number was for the first time printed in colours, and in 1861 photography was used for preparation of a wood engraving. The paper was the pioneer in Great Britain of photogravure printing for newspapers and made a feature of war pictures by well-known artist-correspondents.

Dr. Charles Mackay, editor 1848–59, was succeeded by J. L. Latey, Clement Shorter, and Bruce Ingram. James Payn, G. A. Sala, and G. K. Chesterton were prominent contributors. Arthur Bryant succeeded the last as contributor of the feature Our Note Book. After the Second Great War, a building at 195–198 Strand, W.C.2, on the site of the original premises of the I.L.N., was bought to house the paper.

Illustration (Lat. *illustrare*, to make clear). Term employed with two principal connotations. (1) In rhetoric, an example, simile, or allegorical figure employed to give additional clearness to the statement of a moral truth. (2) In art, the pictorial elucidation of the printed word by diagrams, and more specifically its ornamentation by explanatory, interpretative, or complementary drawings or photographs.

The embellishment of manuscripts with designs and pictures wrought by hand belongs properly to the art of illuminating (*q.v.*). The history of book illustration is coterminous with the history of printing. Books containing illustrations, engraved on copper and wood, have existed from the 15th century. But for practical purposes the art may be divided into three periods: (1) the copper and steel plate period, middle of the 18th to the middle of the 19th century; (2) the woodcut period, the whole of the 19th century; and (3) the "process" period—half-tone and line or facsimile—which, beginning towards the end of the 19th century, became peculiarly the product of the 20th.

Steel plates were costliest; woodcuts, though also costly, were the most convenient and most adaptable; process blocks were by far the cheapest, though to obtain the best results from half-tones they must be printed on heavy glazed art paper, which adds very appreciably to the weight of the volume and the durability of which remains to be proved. Steel plates were printed on thick plate paper, and their elegance and finish rendered them exceedingly attractive. They were the special features of various literary Annuals such as Forget-Me-Not (1822–44), Keepsake (1827–56), and the Book of Beauty (1833–53). The most sumptuous book ever adorned by steel plates was the edition of Samuel Rogers's Italy (1830), which contained exquisite illustrations after J. M. W. Turner, and is said to have cost £10,000 to produce.

The growing popularity of woodcuts at length gave the steel plate its deathblow. Apart from their greater cheapness, wood engravings had a double advantage. They could be printed with the letterpress as an integral part of the book on ordinary paper without detriment to their appearance, and by taking one or more electrotypes of them and printing from these, the original woodblock was preserved unimpaired, and with care lasted for an indefinite period.

The publication of illustrated periodicals, such as Punch, The Illustrated London News, and The Graphic, of pictorial Bibles, histories of England, Shakespeares, and other classics, would have been impossible but for woodcuts. The demand for them was so great and regular that many distinguished artists may almost be said to have made their début as draughtsmen on the wood.

Effects of Process Engraving

Woodcuts were eliminated by process engraving, the cheapness of which offered publishers an irresistible temptation. When ten process blocks could be got for one engraved on wood, book illustration was revolutionised. The market was flooded with pictorial "albums" of every description, and when these had had their day, weekly periodicals of all sorts and sizes multiplied indefinitely, and in time the illustrated daily appeared. In wiping out the woodcut, process destroyed a fine art, and in utilising the camera it played havoc with the black and white artists. Still, there must always be a considerable demand for original drawings, and since process reproduces the draughtsman's design with mechanical precision, it possesses, to that extent, an undeniable advantage. This is particularly true of the line process, which presents no difficulties to the printer, whereas the half-tones must be "made ready" with exceptional care, and printed on specially made paper. See Drawing; Engraving; Half-tone; Manuscripts; Photo-Engraving; Photogravure; Woodcut.

Illyria or **ILLYRICUM**. Term used in ancient times to designate broadly the country on the Adriatic coast N. of Epirus, extending as far as the river Dravus (Drave), and bounded E. by Macedonia and Upper Moesia. It included roughly what are now parts of Yugoslavia—Montenegro, Bosnia, Herzegovina, Dalmatia—and S.W. Hungary. The Illyrians were a hardy, warlike people, apparently racially akin to the Scythians. They were

conquered by Philip of Macedon in 359 B.C., but after Alexander's death in 323 they threw off the Macedonian yoke. Under their queen, Tueta, their piratical depredations brought them into conflict with the Romans, and in 229 they were defeated, and compelled to cede territory and pay an annual tribute. A rising, in which the Illyrians were led by their king Gentius, ended in the annexation of the country by the Romans in 168. There was sporadic fighting, however, until A.D. 9, when the country was finally conquered by Tiberius and the Roman province of Illyricum was established.

Under the empire the country was a great recruiting ground for the legions, and the emperors Claudius II, Aurelian, Diocletian, and Maximian were Illyrians of humble birth who reached the purple through military command. In 476 Illyricum became part of the Eastern empire. In the 7th century the country was occupied by Slavonic invaders, and the name Illyria or Illyricum disappears from history until in 1816 the Austrians created the kingdom of Illyria, including among other territories Carinthia, Carniola, and Istria. Until 1849 this was one of the states of the Austrian empire.

Shakespeare used the name Illyria for the mythical country in which the action of *Twelfth Night* takes place.

Ilmen. Lake of N.W. Russia, in the region of Leningrad. Its area is 350 sq. m., length 30 m., greatest breadth 24 m. It is fed by various rivers, notably the Lovat, which flows into it from the S.; and its waters are discharged N. by the Volkhov into Lake Ladoga. Between the two communication points of Novgorod to the N. and Staraya Russa to the S., the lake was in the centre of fighting during the Second Great War. From Sept., 1941, until Jan., 1943, the lake—by water in summer, over the ice in winter—was the only link between beleaguered Leningrad and the rest of the Soviet Union.

Ilmenau. German town and spa, in Thuringia, 30 m. S. of Erfurt, at a height of 2,000–2,500 ft., called after its small river Ilm. Formerly a summer residence of the Weimar dukes, it is famous as one of Goethe's haunts. It was a town by 1341, and has a fine 17th cent. palace, church, and town hall. In its industrial suburb there were china, glass, thermometer, toy and dye factories. Pop. 13,820.

Ilmenite. An accessory mineral in rocks, especially common in association with the more basic igneous rocks, often as large masses. It occurs as black to brownish-black tabular crystals (hexagonal-rhombohedral), grains, or masses. Chemically it is iron, magnesium, and manganese titanium oxide (Fe,Mg,Mn TiO_3). Ilmenite proper is iron-rich grading into geikelite, which contains much magnesium; pyrophanite is a manganese-rich variety. Ilmenite is one of the ore minerals of titanium, and much of the world's supply is derived from alluvial sands. Sources are India (68 p.c.), Norway (25 p.c.), Malaya, Canada, Senegal, and the U.S.A.

Ilminster. Urban district and market town of Somerset, England. It stands on the river Ile, with a



Ilminster, Somerset. The parish church of S. Mary, a fine example of Perpendicular architecture

rly. station 5 m. N.E. of Chard. It has a fine church and a grammar school. In the church are buried Nicholas and Dorothy Wadham, the founders of Wadham College, Oxford. Ilminster makes bricks, and tiles, and a large dairy has been established. Pop. 2,232.

Ilocos Norte. Prov. in the N.W. of Luzón, Philippine Islands. Bordering the China Sea, it covers an area of 1,265 sq. m. It consists of the W. slopes of the N. section of the Caraballos Occidentales, and is watered by numerous mountain torrents. The province grows cotton, sugar, maize, and tobacco, and has numerous paddy-fields. Cattle, horses, goats, and pigs are reared, and fishing is carried on. Copper, iron, and manganese deposits are worked. Laoag is the capital. Pop. 222,000.

Ilocos Sur. Province in the N.W. of Luzón, Philippine Islands. Covering 492 sq. m., it is a long, narrow coastal plain watered by numerous streams. The Abra enters the sea near Vigan, the capital, and its lower course is navigable. Cotton, paddy, sugar

cane, maize, and peanuts are the chief crops. Cattle, sheep, and goat rearing are important occupations. Pipes, hats, and baskets are made. There are copper mining and lumbering interests. Pop. 219,000.

Iloilo. Prov. of Panay, Philippine Islands. It consists of the S. part of the island and about 60 islands, and covers an area of 2,102 sq. m. Many streams drain from the pine-forested mountains which form the N. and W. boundaries; some are navigable by native craft. Products are rice, sugar cane, maize, coffee, hemp, and tobacco. There are gold and iron mines and quarries. Iloilo is the capital. Pop. 510,000.

Iloilo. City on the S.E. coast of Panay, Philippine Islands. It is the capital of the prov. of Iloilo, and is a terminus of the Panay rly. and has an airport. It has a good harbour, exports sugar, rice, tobacco, dyewoods, and hardwoods, and manufactures lime, jute, vinegar, hats, and machinery. Pop. 90,480.

Ilorin or ILORIN. Region in the Northern province of Nigeria. Bounded N. by the Niger, S. by Ondo and Benin, and W. by Oyo and Kontagora, it is divided into the two main districts of Ilorin and Kabba. The country forms part of the basin of the Niger, here defined by the crest of a lofty plateau sloping gradually towards the Niger, and S. to the sea. The N. part of Kabba is more rugged.

The country is rich in agricultural products. It contains the two minor emirates of Shonga and Lafagi, and the semi-independent towns of Awton, Ajassa, Offa, and Patiji; the N.W. portion is traversed by the Iddo-Kano rly. In 1825 Ilorin fell under Sokoto influence, and in 1897 was occupied by the Royal Niger Company. Pop. (mainly Yorubas) 360,000.

Ilorin or ILLORIN. Town of N. Nigeria. Situated at a height of 919 ft. above sea level, on the Iddo-Kano rly., 243 m. N.N.E. of Lagos and 541 m. S.W. of Kano, it is a walled town and a great trading centre, with manufactures of leather, pottery, shoes, and cotton. The King's Market of Ilorin is famous. The chief building

is the palace of the ruler. Ilorin was founded at the close of the 18th century, and became the capital of one of the Yoruba kingdoms. Pop. 54,684.

Il Penseroso. Lyric poem to melancholy, by John Milton (*q.v.*). It was written, as was its companion poem, *L'Allegro*, in the early days of the poet's residence at Horton, 1632-38.

Ilus. In Greek mythology, the legendary founder of Ilium or Troy. He was the father of Laomedon and grandfather of Priam.

Ilvaite, LIEVRITE, OR YENITE. Complex mineral silicate of iron and calcium, occurring in black prismatic orthorhombic crystals, also compact, massive, opaque. Ilvaite is found in magnetite ore bodies, with zinc and copper ores, in contact-metamorphic deposits, and with zeolites. It is named from the Latin for the island of Elba, which was Ilva.

Image (Lat. *imago*, likeness). In optics, the reproduction of an illuminated object. It may arise from rays of light which after proceeding from the object have been (1) reflected from a mirror; (2) refracted from a lens; or (3) passed through a small aperture in a screen. In the last case the image will be in focus, *i.e.* its outline is sharp, wherever the plane surface receiving the image is situated. This is the principle of the pin-hole camera. A wide

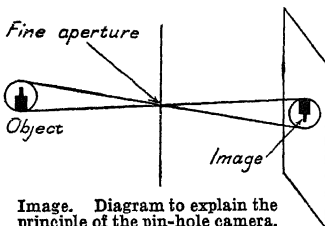


Image. Diagram to explain the principle of the pin-hole camera. See text

angle of view is taken in without distortion of the image, but for a photograph a very long exposure is required.

When mirrors and lenses are employed in image formation, focusing is necessary, *i.e.* for a given position of object there will be only one position of the screen where the image is sharp. This is governed by the type of lens or mirror and the distance of the object from the lens (or mirror) in relation to the focal length. A real image, *i.e.* one which can be received on a screen, is produced only when all rays proceeding from a given point on the object after refraction (or reflection) actually pass through a point

(Fig. 2). A virtual image has no real existence; the rays after refraction (or reflection from a

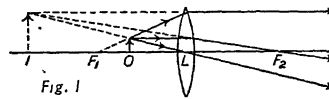


Fig. 1

mirror) apparently intersect only when they are produced backwards; a virtual image cannot be received on a screen but

can be seen by an eye suitably placed on the opposite side of the lens to the object. Fig. 1 shows the formation of a virtual image *I* by a curved lens when the object *O* is between the focus F_1 , and the lens *L*. F_2 is the focal point on the other side of the lens.

Image, SELWYN (1849-1930). British artist. Born at Bodiam, Sussex, he was educated at Marlborough, New College, Oxford, and the Oxford Slade School, under Ruskin. Ordained in 1872, he was curate of St. Anne's, Soho, 1876-80, but his bent towards art decided him to follow it professionally. His chief work was the designing of stained-glass windows, characteristic examples of which were the windows for the Prince of Wales's pavilion in the Paris Exposition of 1900; the west window in St. Luke's, Camberwell; and the Four Archangels in Mortehoe church, Devon. During 1910-16 he was Slade professor of fine arts at Oxford. He died Aug. 21, 1930.

Image Worship. Adoration of statues or pictures of sacred persons or things. In the O.T., where idol worship is condemned, are many references to sculptured, graven, and molten images of clay, wood, silver, and gold. In the Christian Church the use of images grew with the development of art. The early Christians, surrounded by representations of pagan gods, doubtless desired to counteract the influence of these with something in keeping with their own faith. Hence the use of emblems, such as that of the dove to represent the Holy Spirit; the Cross; and mystical monograms. As art progressed, statuary and frescoes were introduced, and the veneration of images led to the rise of the Iconoclasts in the 8th-9th centuries. In medieval times sacred images were often associated with miracle working, and their veneration sometimes approached idolatry.

At the Reformation, while Lutherans were comparatively indifferent on the subject so long

as the images themselves were not worshipped, the Calvinists and Puritans rejected them entirely, and in England many priceless and unobjectionable works of art were destroyed by the zeal of the Reformers. The 19th century witnessed a notable revival in the

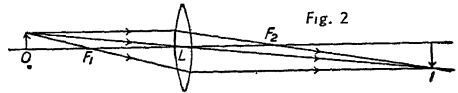


Fig. 2

Image. Fig. 1. How a virtual image is formed. Fig. 2. Production of a real image. See text

use of sculpture, stained-glass windows, etc., in places of worship. The R.C. Church forbids absolute, but permits relative, homage to representations of Christ, the Virgin Mary, and the saints. The Greek Church permits the use of the icon and of pictures. Islamism rejects all representations of living things. See Emblem; Golden Calf; Icon; Iconoclast; Idolatry.

Imaginary Conversations.

Prose work by W. S. Landor, published 1824-46. It includes classical dialogues, *e.g.* between Diogenes and Plato, dialogues of literary men, sovereigns, statesmen, etc., *e.g.* between Peter the Great and his son Alexis, and dramatic presentations of character. The best edition is that by C. G. Crump, 6 vols., 1891-1901.

Imagination (Lat. *imago*, likeness).

The power of combining mentally items of experience so that they form a new unity which may or may not correspond to a real object or event. This power can be exercised voluntarily, as in composing a picture, working out a new theory, enjoying a day-dream, or "putting oneself in another's place." Or it may work involuntarily under the influence of fear or excitement, a process noted by Shakespeare in the line, "How easy is a bush supposed a bear." Here the actual experience is releasing unconscious feelings of anxiety or guilt, which dictate the form taken by the imaginary danger or vision.

Imago (Lat. likeness). The biological term given to the adult or perfect stage of an insect, after it has completed growth and metamorphosis. Generally, but by no means always possessing wings, the imago has as its main function the propagation of the species. Some insects, including mayflies and certain moths, do not feed in the imago, their mouthparts being non-functional.

Imām OR **INAUM** (Arab., leader, president). Mahomedan title with various meanings. It was given



Imām of Persia
reading the Koran

to certain Mahomedan princes in the early period, *e.g.* the caliphs, and survives in modern times, *e.g.* the imām of Yemen; to the twelve chief heads of the Shiite or Shiah sect; to the founders of a theological system among the Sunnites, and of the four orthodox Mahomedan sects. In modern usage, the name specially indicates the minister who officiates in the mosques at public prayers; he represents the people, and his office has no sacerdotal character.

Imandra OR **INANDRA**. Lake in N.W. Russia, called, in Lappish, Aver. It lies across the boundary of the Murmansk region of the R.S.F.S.R. and the Karelo-Finnish S.S.R., on the peninsula of Kola. Its area is 350 sq. m., length 50 m., and average breadth 6 m. It discharges its waters by the Niva into the bay of Kandalaksha, in the W. of the White Sea. It is frozen over most of the year, but is much frequented in summer by Lapp fishermen. The rly. from Kola to Kandalaksha passes its E. shore.

Imari. Japanese ware. It is a mixture of white clay and ground feldspathic rock, forming a fine stoneware, or porcelain. It was first made in the province of Hizen, now Nagasaki, in 1600. The painting is under glaze, the earlier pieces being modelled on Korean and Chinese specimens; the latter are characterised by vitrifiable enamel relieved with gold, but more particularly with handsome paintings of chrysanthemums and peonies in a lilac blue, lustreless red, and matt gold.

Imbabura. A department of Ecuador, bounded W. by Esmeraldas, S. by Pichincha, N.E. by Carchi. Its area is 2,414 sq. m. Amid the Andes, it is mostly mountainous, containing the volcano Imbabura, 15,000 ft. in alt. Well watered by the Verde, Mira, and other streams, it is very fertile, but stock raising is the chief occupation. The capital is Ibarra (*q.v.*). Pop. 146,230.

Imbecility (Lat. *imbecillus*, feeble). Grade of mental deficiency dating from early life, characterised by a lesser degree of social incapacity than is idiocy (*q.v.*).

Imbros OR **IMBRO**. Island near the entrance to the Dardanelles, belonging to Turkey. It is in the Greek Archipelago, in the N.E. of the Aegean, and about 100 sq. m. in extent. The chief town is Kastron, or Castro, the seat of a Greek bishop. The island is fertile and produces cereals, fruit, and silk. After the British evacuated Gallipoli, Dec., 1915, they used Imbros, then held by the Greeks, as a military base. It was restored to Turkey in 1932.

Imhotep (*f. c.* 3000 B.C.). The earliest known physician. He was chief minister, architect, and physician to Zoser, a king of the III dynasty of Egypt. Zoser's pyramid at Sakkara, the first built in stone, was designed by Imhotep. So great a reputation for wisdom in magic and medicine attached to him that he became a demi-god and was identified by the Greeks with Asklepios.

Imitatione Christi, DE (Concerning the Following of Christ). Treatise on the religious life by Thomas Hammerken, or Thomas à Kempis. *See* à Kempis.

Immaculate Conception. Doctrine of the R.C. Church declaring that the Blessed Virgin Mary, from the first moment of her conception, was preserved from all stain of original sin, through the foreseen merits of Christ. Mary's sinlessness is referred to in general terms by Justin, Tertullian, and Irenaeus by the 2nd century. By the 6th century it was more explicitly taught by Fathers of both East



Imari. Bowl of this Japanese ware with painted design

and West. From the 12th century, until its definition as an article of faith, it caused controversy between the Dominicans, most of whom rejected the doctrine, and the Franciscans. The feast of the Immaculate Conception was kept in the East in the 8th century and in England before the Norman Conquest; it was extended to the whole Latin Church in 1476. Defined as an article of faith by Pius IX on Dec. 8, 1854, the doctrine is quoted by R.C. theologians as a classic example of the gradual development of a doctrine. *See* Incarnation.

Immanence (Lat. *in, in; manere*, to remain). Name given to a pantheistic theory of the universe. It means that the intelligent cause of the universe is shut up in the universe itself, and is neither exterior nor superior to it. *See* Pantheism.

Immanuel OR **EMMANUEL** (Heb., God is with us). Hebrew proper name. It was the name or title of a child whose birth Isaiah (7, v. 14) predicted as a sign from heaven that God would preserve Judah from destruction at the hands of its foes. In Matthew (1, v. 23) the prophecy is applied to Christ as the Messiah and Saviour of His people. *See* Jesus Christ.

Immermann, KARL LEBERBECHT (1796-1840). A German novelist and dramatist. Born at Magde-



Karl Immermann,
German novelist

burg, April 24, 1796, he fought at Ligny and Waterloo, and in 1817 entered the Prussian public service. He became judge at Magdeburg, 1823, and Düsseldorf, 1827, where he was for two years (1834-36) director of the theatre. He wrote many romantic plays, but was more successful as a novelist; in *Die Epigonen* (The Decadent Descendants), 1836, he contrasted the old social order and the new epoch of the factory and machine; *Münchhausen*, 1839, was a satiric romance; *Der Oberhof* (The Upper Court) was his most popular work. He died Aug. 25, 1840.

Immigration (Lat. *in, into; migrare*, to move). Entrance into a land of people from another country for the purpose of settlement. It is thus the complement of emigration, for all immigrants are necessarily emigrants. It may be the movement of persons to another part of an empire, *e.g.* Gt. Britain to Australia, or it may be their entrance into countries under another rule, *i.e.* alien immigration.

The peoples of all countries have, at some time or other, been affected by such migrations. In the contemporary world, the outstanding example of a country whose pop. is founded on immigration is the U.S.A. Except for the Red Indians every member of its 140 million people is either an immigrant or of immigrant descent. No records, however, of the annual influx from abroad were kept until 1820, in which year the number entering the country was only 8,385. By 1830 it had risen to 23,322. The

total reached a much higher figure during the 1850s, and after the Civil War immigration was greatly accelerated. It was deliberately stimulated by the railroads, which in their eagerness to colonise the Western plains flooded the Old World with tempting advertisements. Their example was followed later by industrialists in search of cheap labour for their mines, mills and factories, as well as by steamship companies seeking an expansion of their traffic. Between 1870 and 1910 more than 20 million Europeans went into America's "melting-pot."

The immigrants responding to this propaganda were of a notably different type from their predecessors, who had been mainly British, Irish, German, and Scandinavian. The lure of the Western "land of promise" was now most potent in Italy and Eastern Europe. The majority of the newcomers crowded into industrial cities, both large and small. A comparatively small group among them made a valuable contribution to American culture in science, education, music and the arts.

By the turn of the century there developed an agitation to put a stop to unrestricted immigration. Attempts by congress to impose a literacy test were vetoed by Presidents Cleveland, Taft and Wilson successively. By a series of laws enacted later, the U.S.A. set a limit, on a quota basis, to the number of annual admissions from foreign countries. There was a drop from 1,218,480 in 1914 to 326,700 in 1915, and again from 241,780 in 1930 to 97,139 in 1931. During the great depression, 1929-33, there were in some years more emigrants from than immigrants into the U.S.A. During the Second Great War immigration went down to 23,725 in 1943. It started upward once more in 1946, with 108,721 entrants. Some particulars of the legislation passed to exclude coolie labour will be found under Coolie.

Immingham. A seaport and parish of Lincolnshire, England. It is 7 m. by railway N.W. of Grimsby. It was a straggling hamlet devoted to agriculture until the 20th century, when the rly. company decided to construct extensive docks here. Begun in 1906, these were opened in 1912 to deal with the coal and other produce of the Midlands, and also with the import of grain and timber. The village has a Perpendicular church dedicated to S. Andrew. Pop. 2,423.

Immoral Agreement. In English law, an agreement unenforceable by reason of its nature. The most common are those by which a man promises to pay an annuity to a mistress. If the consideration for such an agreement is future immoral relationship, then it is unlawful and void. But if, cohabitation having ceased, the man, by deed under seal, promises to pay, his promise can be enforced. When a gift has been given in consideration of immoral relationship, the donor cannot sue for its return.

Immortal Hour, THE. Drama by "Fiona Macleod" (William Sharp) with music by Rutland Boughton. The first London performance was given in 1920, at the Old Vic, when Gwen-Ffrangcon-Davies sang the part of Etain. Notable for the delicacy of its music, as in *The Faery Song*, and for its "fey" Celtic atmosphere, it was produced at the Regent Theatre, 1922. Later revivals included those at the Kingsway Theatre, 1926; and Queen's Theatre, 1932.

Immortality (Lat. *in*, not; *mortalis*, subject to death). Condition of being exempt from death. Belief in life after death has been almost universal, but its character has varied greatly. At first it may have been due to the dream-images of departed friends or to similar causes, but it persists when such supports have long passed away, and rests upon many dimly-felt lines of evidence. The force of some of these can be recognized by all, but others are bound up with moral and spiritual insight and experience. A full belief in immortality is a prize to be won, and we find retrogression as well as advance in men's thoughts about the future life, among both nations and individuals. The Egyptians and the Persians seem to have possessed noble conceptions of the life to come earlier than the Hebrews, but to have failed to maintain them owing to the lower character of their religion.

The simplest arguments for the continued life of the soul after death are these: The principle of conservation demands it. The dead body is no equivalent for the living man. Something has passed away, upon which its life and activity depended, and we cannot suppose that this has been annihilated. The soul, that "constant centre, to which we refer all our acts as their source and all our experiences as their receptacle" (Martineau), is directly known by us to have an existence of its own, and there is nothing to show that the death of the body destroys it. The exact relations of soul and body constitute an unsolved problem; each has the power to affect the other. But all true human activity is initiated by the soul, and the soul affects the body more than it is affected by it.

Materialism, which represents the soul as a mere "epiphenomenon" or secondary phenomenon of the body, is false for two reasons. First, it is only through the soul's consciousness that material things are known at all; secondly, material changes depend upon antecedent conditions, while the changes brought about by the power of our wills are due to ends which we are seeking in the future.

All such arguments, however, for a future life afford little satisfaction. Not only do they apply to living creatures other than men, but they suggest an impoverished existence after death, rather than a nobler one. Far more satisfying arguments are drawn from the moral and spiritual experience of mankind, and it is to these that we must turn. We observe then, first, that just as science would be impossible unless we started with the assumption that the world is an intelligible whole, so religion and morality would be impossible unless we started with the assumption that the world is also morally intelligible to the innate moral sense of man.

But this demands a future life for many reasons. The long course



Immingham, Lines. Part of the dock system; the power house is seen in the left background, with the general office on the right

of evolution has led up to man; if the world has a meaning, that meaning must be bound up with man; and human nature is not intelligible if death is the end. Human nature is far too great a thing for the present world. It can neither be satisfied here, nor realize here more than a small part of its possibilities. All that is best in man bears witness to an illimitable power of life and growth, and it is upon this that the value of human personality depends. The best men and women have ideals of truth, beauty, goodness, and love, for which they will make the last sacrifice, and thus assert their abiding value.

Our instinctive claim for justice demands a future life. We cannot rest in the thought of a world in which goodness and happiness are not found ultimately to be united, and this they are not in the world as we know it. Not only does individual human life demand a future indefinitely extended, if it is to be intelligible, but the corporate life of the race also demands it. The force of these deeper arguments will vary with the value we have come to set upon truth, beauty, and goodness, and the sacrifices we have made for them.

In Europe and America today belief in the future life rests largely upon the teaching of the Christian Church, but the considerations outlined above have their place in the experience upon which the Church relies. More slowly, but more surely than some other nations, the Hebrews had reached before the birth of Christ a noble belief in immortality. It seems to have rested mainly upon two considerations. First, since the Hebrew saints had suffered for their highest ideals as no others had done, they understood as no others that the sufferers must have their share in that "kingdom of God" where righteousness will be at last triumphant. Their belief in the resurrection was essentially a belief in the wholeness of life, a belief that nothing would be lost of the full personality of the servant of God. Secondly, the Hebrew saints attained to a deeper communion with God than others, and found in Him the "fountain of life." These who were one with Him and His purpose felt that they were assured of eternal life in Him.

Now all that the Hebrews had thus come to believe was confirmed by the teaching of Christ, and still more powerfully by His resurrection. The life of Christ was itself a life spent in the cause of righteous-

ness, and at last sacrificed for it; it was also the one life lived in perfect union with God and conformity with His will.

Not only did the value of that life demand its continuance, and the instinctive claim for justice demand its vindication, but the Christian Church was founded upon the certainty of the Apostles that the risen Christ had repeatedly manifested Himself to them, and assured them that the continuance and the vindication had been in fact given. Moreover, the Apostles were conscious that the life of the risen Christ was by His Spirit reproduced in themselves, so that eternal life was already their possession. It was a life which led them continually to service and sacrifice like that of their Master; but it was a life over which death could have no power. See Heaven; Purgatory; Survival.

H. L. Goudge

Bibliography. Christianity and Immortality, V. F. Storr, 1918; The Idea of Immortality, A. S. Pringle-Pattison, 1922; And the Life Everlasting, J. M. Baillie, 1934; The Hope of Immortality W. R. Matthews, 1945.

Immortals. Name popularly given to men and women famous in history in whatever association. Thus certain Persian troops, Julius Caesar, Joan of Arc, and Napoleon are referred to as immortals. The word is now specially used to designate the members of the Académie Française (*q.v.*).

Immunity. The capacity of an animal organism to resist the effects of bacterial invasion. The term is more loosely applied to signify non-susceptibility to a disease or a poison. Thus the Styrian mountaineer can safely swallow doses of arsenic, and the addict go unharmed by lethal doses of morphia. Immunity may be natural: rats and dogs do not take anthrax, nor negroes yellow fever (conversely, an infection gaining ground where it was hitherto unknown can take severe toll, *e.g.* measles among savage tribes).

Acquired immunity may result from the recovery of a patient from an acute condition. This may be long or short, according to the nature of the disease. Measles and scarlet fever are not caught twice, but after pneumonia there is only a short period of protection against a fresh attack. Influenza carries no immunity.

On this problem of immunity much work was done by Pasteur, who in 1880 showed that active immunity is conferred by the introduction into the body of bacteria,

living or dead, or their toxic derivatives. On this concept the whole structure of vaccine therapy depends. Vaccination against smallpox and inoculation against typhoid and cholera are examples of active immunising.

In the past there have been two theories regarding the nature of immunity: the cellular, associated with the name of Metchnikov, and the humoral, associated with that of Ehrlich. The former thought immunity depended upon the attacking white cells; the latter that bacteria were killed by a substance elaborated in the body fluids. The truth lies between the two. The white cells are inactive against bacteria unless the bacteria are bathed in serum containing the specific antibody of the disease.

Towards the end of the 19th century Behring discovered that the serum of actively immunised animals when transferred to other animals conferred immunity on the latter; this process being termed passive immunity. It is necessarily transient, depending upon the amount of the substance introduced. An example is serum therapy as used in diphtheria; the blood serum of a horse which has been treated with the toxin of diphtheria, to which it has become gradually resistant, is introduced into the body of the patient and lends to him in his fight for health the capacity acquired by the horse to overcome the poison.

IMMUNISATION. This term covers any method by which an animal is rendered resistant to invasion by disease. In smallpox it is now achieved by introducing under the skin the toxin of the allied disease of cow-pox; in cholera, the typhoid groups, colds, etc., by the hypodermic injection of a measured quantity of the dead organisms with their toxins. By using the serum of a patient convalescent from measles or scarlet fever, delicate contacts may be spared these diseases or will take them in a mild form. Much work is being done to find a method of immunisation against tubercle.

Hilary Ledgerwood, M.B.

Imogen. Leading female character in Shakespeare's tragedy *Cymbeline* (*q.v.*). She is the prototype of devoted wives and resourceful women.

Imola (anc. Forum Cornelia). City of Italy, in the prov. of Bologna. It is picturesquely situated on an island in the Santerno, 21 m. by road and rly. S.E. of Bologna on the route to Ancona. Its 12th cen-

tury cathedral has been modernised. Other ancient churches and palaces include that of Catherine Sforza and the Palazzo Paterlini. It has a 14th century citadel, now utilised as a prison, a large mental hospital, an agricultural school, and a public library containing valuable MSS. Imola has been the see of a bishop since the beginning of the Middle Ages. Wine and vegetables are produced, and the manufactures include soap, majolica, gunpowder, brick, silk, leather, and glass. Pop. 37,000.

Impact. Collision of two or more objects. The force involved may be large but acts for only a short time. The force varies in a complicated manner during the collision and is dependent upon the elastic properties of the bodies involved as well as upon their speeds. In studying such problems it is usually more convenient to consider the momentum of the system. Unless an external force acts on the system, the momentum lost by one body (or set of bodies) is equal to that gained by the other body (or set of bodies). Only with perfectly elastic bodies would the total kinetic energy be the same before and after contact, because with imperfectly elastic or inelastic bodies some kinetic energy is transformed into heat on impact.

Impala. Native name for the S. African antelope (*Aepyceros melampus*), sometimes also termed pala. It is a rather large species, slightly more than three feet in height, with somewhat spiral lyrate horns. It is described by hunters as the fleetest of the antelopes. From its red colour it is known by the Boers as the rooibok.

Impaling (Lat. *in*, on; *palus*, stake). In heraldry, a method of marshalling two or more coats of

arms on one shield, the arms being placed side by side. This was usually done to record matrimonial alliances, the arms of the husband occupying the dexter



Impaling in heraldry

ter half and those of the wife the sinister side, but if the wife was an heiress, holding superior feudal estates, her arms took precedence. In some instances a husband placed his own arms between those of his second and first wife. Arms of office, e.g. those of a bishopric, deanery or king-of-arms, are also impaled, these taking precedence

of the paternal coat. See Coat of Arms; Heraldry.

Impasto (Ital., spread with paste). Term used in painting. It denotes the laying on of opaque colours in thick masses diluted with no other vehicle than a limited quantity of oil. Its effect is supposed to add strength and solidity to the work, and to enhance its richness. See Painting.

Impeachment (Fr. *empêchement*, from late Lat. *impedicare*, to fetter the feet). In English law, parliamentary prosecution by the house of commons, before the house of lords as judges, of a person accused of treason or any other crime or misdemeanour. Being, in Blackstone's words, a "presentment to the most high and supreme court of criminal jurisdiction by the most solemn grand inquest of the whole kingdom," this form of judicial procedure was reserved for ministers of state and other great personages charged with treason or gross maladministration, and is now virtually obsolete, although the house of commons undoubtedly retains its powers in this respect unimpaired.

The initiative rests exclusively with the commons, who, having decided to act, appear in the person of the mover of the motion at the bar of the lords and there impeach the accused in their own name and the name of all the commons of the U.K. The actual procedure follows the lines of an ordinary trial. At the conclusion the president, either the lord high steward or the lord chancellor, calls upon each peer individually to declare upon his honour whether the defendant is guilty or not guilty. The first person to be impeached was Lord Latimer in 1376, and the last Lord Melville in 1806. The most memorable impeachment was that of Warren Hastings (*q.v.*), begun in 1788 and ended with an acquittal in 1795.

In the U.S.A., impeachment is still a living part of the political and legal system. Many officials besides occupants of the highest posts are amenable to it. The federal constitution prescribes that "the president, vice-president, and all civil officers of the U.S. shall be removed from office on impeachment for, and conviction of, treason, bribery, or other high crimes or misdemeanours." The house of representatives has the sole power of impeachment, and the senate, sitting for the purpose on oath or affirmation, must try the case. No person may be convicted without the concurrence of

two-thirds of the members present. Judgement must not go further than removal from office and disqualification to hold further office.

There have been thirteen such trials. The only president impeached was Andrew Johnson in 1868, for usurpation of the law, corrupt use of the veto power, interference at elections, etc. His trial, lasting three months, ended in acquittal. Charges brought against officials have included drunkenness, disregard of statutes, misconduct at trials, tyrannous treatment of counsel, supporting the secession movement (in 1862), accepting bribes. The latest impeachment trial took place in 1936.

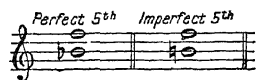
Impedance. In electricity, a term for apparent or virtual resistance, including, in addition to ordinary resistance, all factors which tend to impede or oppose the impressed electro-motive force in a conductor. For example, if a direct current be passed through a straight conductor, the only resistance encountered is the true resistance of the conductor, but if an alternating current be passed through a circuit, at every alternation a counter electro-motive force is set up by the self-induction effected which constitutes virtually an increased resistance. See Circuit, Electric; Current; Electricity.

Imperative (Lat. *imperare*, to command). In grammar, one of the modes or moods of the verb. It denotes that the action is not stated as a fact, but in the form of a command or request, which may be distinguished by the tone of voice. The stem alone, as the simplest form of the verb, may be used to express this (as in English), although personal suffixes may also be added. Virtually an interjection, the imperative may be represented by a single noun (e.g. silence!). In philosophy, the term categorical imperative (invented by Kant) signifies the absolute command of the moral law.

Imperfect (Lat. *imperfectus*, incomplete). In grammar, a tense or time of the verb. It expresses incomplete or sustained action in the past (I was reading, when). In the Slavonic languages, it is the name of one of the "aspects" or forms of the verb which express modification of the original meaning. The imperfect aspect may refer to present, past, or future (I am writing, I was writing, I shall be writing). See Grammar.

Imperfect. Term employed in music. (1) Amongst consonant intervals, thirds and sixths are sometimes known as imperfect.

(2) Intervals of fourths or fifths, which are a semitone less than perfect fourths or fifths, are called imperfect, e.g.



(3) Duple or quadruple time was formerly called imperfect, and was indicated by a half circle C, now corrupted into C; triple time, being reckoned perfect, was shown by a complete circle O. (4) Imperfect cadence is one ending on the dominant chord.

Imperia. Another name for Porto Maurizio (*q.v.*), city and seaport of the Italian Riviera.

Imperial Airways. British national air transport company, merged in 1940 into British Overseas Airways Corporation (*q.v.*). Imperial Airways was itself formed by a merger, the date of foundation being 1924 and the constituent companies, Handley Page Transport, Instone Air Line, Daimler Airways, and British Marine Air Navigation. It was long the only U.K. company operating regular commercial services, including those from London to the Continent, and the progressively developed routes throughout the Empire. These were operated with the aid of a government subsidy. See Air Line; Air Transport.

Imperial Chemical Industries. Industrial combine formed in Great Britain in 1926 by the fusion of Brunner Mond and Co., British Copper Manufacturers, British Dyestuffs Corporation, Cassel Cyanide Co., Castner-Kellner Alkali Co., Nobel's Explosives Co., Sedgwick Gunpowder Co., and Welsbach Light Co. Since then the undertaking has expanded by other mergers and by developments within itself, some of which amounted to the creation of virtually new industries. In 1947 I.C.I. operated some 80 factories throughout the U.K., with 80,000 men and women working on 12,000 different products, including alkalis and acids, dyestuffs, building materials, explosives, ammunition, fertilisers, drugs, metals and alloys, plastics, and petrol. The combine was represented by manufacturing and marketing organizations in many countries. Its authorised capital was £75,000,000, held by approx. 250,000 shareholders.

Imperial College of Science and Technology. A British educational centre, in London. It was established by royal charter in 1907 and includes the Royal

College of Science, Royal School of Mines, and City and Guilds Engineering College. A school of the university of London, specialising in science and engineering, it awards diplomas of associateship (A.R.C.S., A.R.S.M., A.C.G.I.) and membership (D.I.C.). Students who comply with university regulations can take London B.Sc. and higher degrees. Administration is vested in a governing body representing the crown, the dominions, the ministry of Education, the university of London, the L.C.C., the City and Guilds of London Institute, the royal commissioners for the exhibition of 1851, the Royal Society, the professorial staff of the college, and learned societies. The offices are in Prince Consort Rd., S. Kensington, with laboratories and lecture rooms near.

Imperial Conference. Meeting of representatives of the nations of the British Empire. Until 1947, when India achieved independence within the empire, and Burma left it, the conference was constituted as follows: the prime minister and other ministers of the U.K., Canada, Australia, New Zealand, and South Africa; the secretary for India and Burma; and other representatives of India and Southern Rhodesia. Newfoundland was represented until 1933.

The conference originated in 1887, when representatives of the self-governing colonies in London for Queen Victoria's jubilee met to discuss Imperial problems. A second meeting was at Ottawa in 1894. At the fifth meeting, in London in 1907, it was decided that the designation should be changed from Colonial Conference to Imperial Conference, and that meetings should be held every four years. In 1917 came the Imperial War Conference. A premiers' conference met in 1921. London was again the scene of conferences in 1923, 1926, and 1930. The Irish Free State (now Eire) first took part in 1923, and Southern Rhodesia in 1930, when the statute of Westminster was drafted to define the relationship between the dominions and the mother country.

An Imperial Economic Conference at Ottawa in 1932 resulted in the adoption of a more vigorous policy of imperial preference. The conference in London in 1937 found Burma represented for the only time, but this meeting, held in conjunction with the celebration of King George VI's coronation,

was not attended by Eire. See British Commonwealth; Imperial Preference; Westminster, Statute of.

Imperial Defence. Coordination of defence organization and services for the protection of the British Empire. In general the dominions are responsible for the defence of their own immediate areas, but strategic defence of the Empire is undertaken by the U.K. government. Up to 1946, questions affecting strategic defence were considered by the Imperial Defence Committee, which co-ordinated the work of sea, land, and air forces, until superseded by a Defence Committee under a cabinet minister. Land, sea, and air forces of the dominions are maintained at their expense, while colonies and protectorates usually make contributions towards the cost of imperial defence. See Defence Committee; Defence, Ministry of.

Imperial Guard (Fr. *Garde Impériale*). French military corps. It grew out of the Corps of Guides

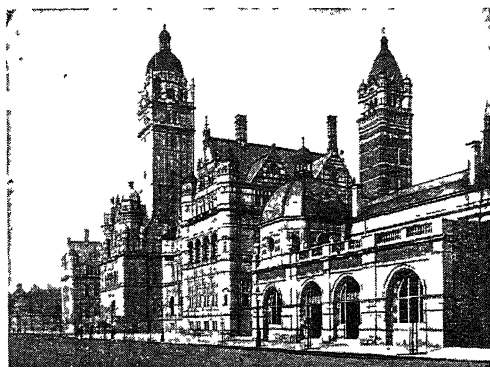


Imperial Guard of Napoleonic wars

used by Napoleon in his Italian and Egyptian campaigns. This became the Consular Guard, and the new title was introduced when Napoleon assumed the imperial title.

Its strength increased from about 10,000 in 1804 to more than 100,000 in 1814. During that period it had been divided into the Old and the Young Guard, and played a great part in many of the Napoleonic campaigns. When Napoleon returned from Elba he gathered a remnant of his Guard, but the corps was broken up by the Restoration. It was restored by Napoleon III by decree of May 4, 1851, and developed to a war-footing strength of about 55,000, but it did not survive the fall of the empire in 1870.

Imperial Institute. Building erected in S. Kensington, London, to commemorate the jubilee of Queen Victoria's reign, the name being also used for the society which has its headquarters therein. The structure is in the Renaissance style, with a main portal surmounted by a square tower



Imperial Institute, South Kensington. The main façade and tower from the south-east

crowned by a dome. This tower is nearly 300 ft. high, and is solidly built of hard bricks set in cement. There is a flanking tower at either end, and the entire front is faced with Portland stone and embellished with handsome mouldings and carvings.

The Imperial Institute was established to promote a better knowledge of life in the overseas empire and to encourage the industrial use of its raw materials. Work is carried out principally by the plant and animal products department and the mineral resources department. Special sections deal with inquiries about sources, production, and marketing of raw materials. Laboratories are maintained for the examination of raw materials and reports issued. Numerous publications and a quarterly bulletin are issued. There are public exhibition galleries and a central film library. A panel of lecturers visit schools to give talks on empire trade.

Imperialism. Term derived from the Latin *imperium*, meaning originally military authority, and then empire. Imperialism is belief in the expansion and development of an empire. The word came into general use in the latter part of the 19th century to describe the policy of those who held this belief in regard to the British Empire.

The imperialists supported the S. African war, and a foreign policy that aimed at maintaining, by arms if necessary, the prestige of Great Britain. They held that the spread of British rule and influence was beneficial to mankind, and were in favour of strong armaments. Imperialists called their opponents Little Englanders, and from about 1895 the Liberal party was sharply divided on imperialism. The movement was a reaction from the dominant teach-

ing of the middle of the 19th century represented by the Manchester school, and it found powerful advocacy in J. R. Seeley's *Expansion of England*.

In the mouth of opponents both in Great Britain and abroad, the designation imperialist came to be something of a term of abuse, implying an exploiter of subject peoples.

It was used thus of the British by the Germans with, by the citizens of the U.S.A. without, envy. Later the U.S.S.R. adopted imperialism as a derogatory term for the anti-Communist attitude adopted especially by the U.S.A.

Imperial Light Horse. Force raised in Natal at the outset of the South African War. It was composed mainly of Uitlanders from Johannesburg, and took part in the relief of Mafeking. See South African War.

Imperial Preference. Term for the giving of preference as regards import or customs duties to goods from one part of an empire entering another part. The practice exists within the British commonwealth. In 1897 the Canadian government allowed a preference to British goods of 33½ p.c. off the duties payable; but the first major step in the U.K. was taken as a result of the Imperial War Conference of 1917, whereafter under the Finance Act, 1919, duties were reduced or abolished on a number of imports from the Empire entering Great Britain, e.g. tea, coffee, cocoa, sugar, dried fruits, tobacco, motor spirit, wines and spirits, motor cars and cycles, clocks and watches, films, musical instruments. The preferences were extended 1923.

At the Ottawa Conference of 1932 it was agreed that duties were to be imposed on wheat and other foodstuffs, and a quota was fixed for bacon, beef, and mutton produced in the dominions. The Import Duties Act imposed a duty of 10 p.c. on all goods imported into the U.K., with exceptions among which were all goods exempt under imperial preference. As a result of this policy the proportion of exports from the U.K. which went to countries of the British Empire reached 50 p.c. by 1937 and the proportion of U.K.

imports drawn from the Empire rose to two-fifths. Requested to abandon imperial preference during the negotiations in 1945 for a U.S. loan, the U.K. refused; but in the Geneva tariff agreement of Oct., 1947, agreed to the reduction by other Commonwealth countries in certain margins of preference. See *Empire Free Trade*; consult also *Imperial Preference*, R. S. Russell, 1947.

Imperial Service Order.

Meritorious and long service decoration for members of the civil service.



Imperial Service Order, men's ribbon and star

Instituted by Edward VII in 1902, and extended in 1909, the companionship is confined to 700 members of the clerical and administrative branches, this number including 250 for home civil service, 250 for civil servants of colonies and protectorates,

and 200 (100 Europeans and 100 natives) for the Indian civil service. Qualifications are 25 years' (20 in India, or 16 in certain unhealthy stations) service. The order can, however, be bestowed upon those who have performed meritorious service without having completed these periods. Men and women are equally eligible. Companions take precedence after those of the Order of the British Empire, 4th class, and immediately before those of the Royal Victorian Order, 5th class.

The badge for men is an eight-pointed star of silver, whereon is a gold medallion bearing the royal and imperial cypher in blue, within a circle inscribed "for faithful service." For women the badge is a similar plaque, but surrounded by a wreath of laurel in place of the star. The ribbon is a stripe of blue between two of crimson of equal width, the woman's worn as a bow. Members of the civil service not eligible for the order may be granted the Imperial Service Medal under the same conditions.

Imperial Tobacco Company.

Formed in 1901, when leading firms in the tobacco trade in Great Britain joined forces to combat the growing competition of U.S. manufacturers. A settlement was eventually reached by which the British and U.S. combines retained their spheres of

influence in their own territories, and a new British-American Tobacco Company was started to acquire the goodwill in all other parts of the world and in the ships' stores trade. The company has its own leaf-buying organizations in the U.S.A., Canada, Rhodesia, Nyasaland, and Syria. It was a pioneer in developing Empire tobacco. Products of the subsidiary companies are marketed under their own names. The head office is at Bristol.

Imperial Valley. Region in Imperial co., California, U.S.A., and Lower California, Mexico. Part of the Great Colorado Desert, as a result of irrigation it has become one of the richest farming areas in the U.S.A. In 1944 the region contained 523,000 irrigable acres, yielding crops to the value of £15,400,000. The valley, 110 m. long and 40 m. wide, has the Colorado river on the E. and the Coast Range on the W. It is mostly below sea level.

Imperium (Lat. *imperare*, to command). Term used to designate the power possessed by certain magistrates of ancient Rome (consuls, praetors, dictators). The imperium included among other things the right to raise and command armies. The outward symbol of the imperium was the *fasces* (*q.v.*). Imperium was also granted to ex-magistrates charged with the administration of a province. See Rome.

Impermeable Barriers. Geological term. Different rocks show varying degrees of permeability to the passage of solutions; any rock relatively impervious is said to constitute an impermeable barrier. These barriers are important in the localisation of ore, water, and oil. Solutions rising through pervious strata may be trapped when they meet a "blanket" of impervious rock, or the latter may act as a filter. Shale bands, fault gouge, and sheets of igneous rock often give impermeable barriers.

Impetigo Contagiosa (Lat., contagious skin-eruption). Disease of the skin due to infection by micro-organisms, usually streptococci and staphylococci. More frequent in children than adults, attacks are not confined to those living in dirty and unhealthy surroundings; it is easily conveyed from one person to another. An eruption of small vesicles first appears on the skin. These later contain pus, then dry, forming yellow crusts about $\frac{1}{4}$ in. or more across. The disease is most fre-

quently seen on the face, scalp, and neck. Treatment is to remove the scales by a starch poultice and apply a mild mercurial ointment. Penicillin and the sulphonamide group of drugs are useful, also gentian violet.

Impey, Sir ELIJAH (1732–1809). British lawyer. Born at Hammersmith, June 13, 1732, he was educated at Westminster and Trinity College, Cambridge. Called to the bar in 1756, he became recorder of Basingstoke, 1766, and counsel to the East India



Sir Elijah Impey,
British lawyer

Company in 1772. Knighted, he was appointed chief justice to the new supreme court of Calcutta, 1774. In the case of *Nuncomar*, Impey won universal praise for his impartiality. In 1782 he endeavoured to extend his jurisdiction to Lucknow, but incurred the enmity of Sir Philip Francis who brought about his recall in 1783. The fall of Warren Hastings involved Impey, against whom charges of corruption were brought. He defended himself successfully before the house of commons but resigned his post. M.P. for New Romney, 1789–96, he died Oct. 1, 1809. See Hastings, Warren.

Imphal. Capital of Manipur state, Assam, close to the Indian frontier with Burma. The plateau extending S. is known as the Imphal Plain. In March, 1944, Imphal, to which the Allied 4th corps had retreated, was isolated and besieged by advancing Japanese, but held out until June 22, when the 33rd corps reopened the road from Kohima (*q.v.*), 80 m. N. in the hills. When the Allies resumed the offensive, Imphal became a military, air, and supply base. Pop. 80,000. See Burma Campaign.

Implacable. Former British training ship. Originally the French *Duguay-Trouin*, she was captured by Sir Richard Strachan after the battle of Trafalgar and under the name *Implacable* served with the British fleet until 1822. In 1925 she was fitted out as a training ship by the Society for Nautical Research, and anchored off Portsmouth. She was taken over during the Second Great War by the Admiralty, but restored to the society in 1947. On Dec. 2, 1949, being beyond repair, she

was ceremonially sunk near the Owers lightship, off the Isle of Wight. From her stern a new entrance hall for the National Maritime Museum was to be constructed.

Importance of Being Earnest, THE. Farcical comedy in 3 acts by Oscar Wilde. Produced Feb. 14, 1895, at the S. James's Theatre, London, it had a short run. Revived at the same theatre, Nov. 30, 1909, it was played 324 times. Other notable revivals included those of 1930 and 1939. In the original production the cast included George Alexander, Allan Aynesworth, Irene Vanbrugh, and Evelyn Millard. In 1939 appeared Edith Evans, Peggy Ashcroft, John Gielgud, and Jack Hawkins. The astonishing sequences of witty and epigrammatic remarks entitle this to rank among comic masterpieces.

Imports. Name given to the goods known to be conveyed into a country by train, ship, aeroplane, or parcel post; the opposite of exports. Imports are inspected and valued by customs officials, who collect taxes when these are payable. The value given to imports includes the price charged by the supplier, plus expenses of insurance and carriage or freight to the place of importation (*c.i.f.* value). Exports are valued free-on-board (*f.o.b.*), *i.e.* cost of insurance and freight is not included. Hence the total of the world's imports exceeds that of exports.

Details of imports and exports of the U.K. are known as board of trade returns, published monthly in the Board of Trade Journal and there periodically analysed to show changes in volume, value, and geographical distribution. British imports are classified in five main groups: (1) food, drink, and tobacco; (2) raw materials and articles mainly manufactured; (3) articles wholly or mainly manufactured; (4) animals not for food; (5) parcel post. In 1948 the first three classes were respectively 42·7, 32·8, and 23·2 of the total, £2,080 millions; in 1938 the corresponding figures were 46·8, 27, and 25·4 p.c. of the total, £920 millions. Thus approximately half the U.K. imports are Group 1 commodities. Principal sources of imports in 1946 were the U.S.A., Canada, New Zealand, India, Australia, and Argentina.

The term invisible imports denotes money values that have to be paid to foreign countries. See Invisible Exports and Imports; Trade.

Imposition (Lat. *in*, on; *ponere*, to place). Literally, the laying of something on another person. It is thus used for a tax or other burden, especially one regarded as unjust or unfair, and also for a punishment given to schoolboys. Other uses are for the laying on of hands by a bishop, and for the arrangement of pages of type during printing. It is used for an act of dishonesty.

In English history the name was given to some additional duties levied on certain imports by James I in 1606. He did this without the authority of parliament, and a merchant named Bate refused to pay. The courts supported the king, holding that his prerogative gave him the power to do this, and in 1608 further impositions were levied. In 1610 parliament declared impositions illegal.

A variant of the same word is *impost*. This is used for a tax or duty levied on goods imported or exported. It is used in architecture for the upper part of a pillar or pier, upon which rests the weight of an arch.

Imposture. Act of deceiving, especially by assuming a name or character other than one's own, or otherwise carrying out an impersonation for selfish motives. The term covers such comparatively unimportant deceptions as those of the beggar describing himself as a shipwrecked sailor, or the quack using a doctor's title, and also more ambitious frauds which have had historical or religious importance.

In this latter connexion many persons, often demented, have won a following by claiming to be of divine origin, or to be the Messiah of their race. Joris David, of Ghent, announced himself as the son of God, and died at Basel in 1556, foretelling his resurrection after three years. Joanna Southcott still has believers in her divine attributes, and Joseph Smith founded the sect of Mormons (*q.v.*) on revelations of doubtful authority. Similarly Islam has produced its false prophets, *e.g.* the Mahdis of the Sudan.

Historical impostors in England have included Lambert Simnel, with his personation of the earl of Warwick, 1487; Perkin Warbeck, who passed as Richard, brother of Edward V. 1492-98; and Elizabeth Barton (*q.v.*), executed in 1534. The Tichborne case (1872-74) was a celebrated lawsuit. The mysterious fate of Louis XVI's heir

brought several claimants to the titles of Louis XVII and XVIII, notably in 1874.

In 1906, a German cobbler, Wilhelm Voigt, disguised as a guards' officer, confiscated the town funds of Köpenick, near Berlin, sending off the chief municipal officials to the capital under military escort; he was sentenced to four years' imprisonment, but released after 20 months. In 1898, De Rougemont (*q.v.*) imposed upon several learned societies with fabricated travel tales. The U.S. explorer Frederick Cook (1865-1940) claimed, 1909, to have reached the North Pole on evidence which was rejected.

Literary impostures and forgeries are numerous. Apocryphal Gospels were common in early times; it has been said that in the 14th century there were about 80 such; and over the False Decretals (*c.* 835) controversy raged for centuries, until they were condemned as false by Pope Pius VI, 1789. In 1704 a fabricated account of the island of Formosa, by George Psalmanazar (1679-1763), attracted much attention. Cagliostro (1743-95) passed off a Polish count's novels as his own. The Rowley poems of Chatterton were issued in 1777 as having been discovered in the MSS. of a 15th century monk, Thomas Rowley. The Ossianic poems published by James Macpherson (1736-96) were probably in great measure from his own pen, not, as claimed, of ancient Celtic origin. Scott in 1806 was imposed upon by the self-made ballads of Robert Surtees, who declared their traditional sources.

Imposture by means of forged works of art is no less common. Noteworthy instances have been the faked bust ascribed to da Vinci, purchased by the well-known German art expert, Wilhelm Bode and the discovery in Paris of a regular trade in forging paintings, to which the name of Corot was assigned. In 1945 a Dutch painter H. van Meegeren admitted to having produced at least seven pictures which experts attributed to Vermeer. One of these forgeries was bought by the Rembrandt Society for £50,000 approx. In 1947 van Meegeren was sentenced to a year's imprisonment, but died a few weeks later. See Bertram, C. J.; False Antiquities; Ireland, W. H.; Literary Forgeries; Wise, T. J.

Impotence (Lat. *impotentia*, inability). Term in medicine and law meaning inability to have

sexual intercourse. In the male the principal causes are advanced age, with glandular failure (although there are many records of men becoming fathers after the age of 80); organic disease, such as locomotor ataxia and other affections of the spinal cord; less frequently, diseases of body chemistry such as diabetes; or local injury to or disease of the parts. A man may be capable of intercourse with one woman and not with another. Also, nervous conditions such as neurasthenia or hysteria, or a shortage of vitamins with abstinence from the normal sexual life (*e.g.* among prisoners of war), may sometimes be responsible for the condition.

In the female the most frequent causes of impotence are a resistant hymen (*q.v.*), spasm of the vagina (*q.v.*), or local inflammations occasioning pain. Distress often arises through ignorance of the mechanics of intercourse.

If the sexual act is unsatisfactory, medical help must be sought at once. Treatment involves combating the underlying cause, which may mean psychological as well as physical investigation. A physical cause may yield to high vitamin intake, stimulation by specific substances such as strychnine and the indicated glandular extracts, or other remedies prescribed by the doctor. If the cause is psychological, there is a high probability of cure by psycho-analysis.

Impotence is a ground for a suit of nullity of marriage. It is, however, of less importance than formerly, as, under the Matrimonial Causes Act, 1937, a marriage may be annulled if there is a wilful refusal to consummate it; it is not necessary to show that the non-consummation is due to impotence.

Impregnable. Shore establishment of the Royal Navy, at St. Budeaux, Plymouth, serving as an overflow for the R.N. barracks at Devonport. Impregnable was originally the name of a training establishment for boys, located in four hulks anchored in Devonport harbour; these were also the official flagship of the C.-in-C. at Devonport. This Impregnable was closed in 1928 and training transferred to shore barracks; the name was revived for the St. Budeaux barracks in 1936.

Impressionism. Name given to a movement in art, originating with a group of French painters in the last quarter of the 19th cen-



Impressionism. Vétheuil : Sunshine and Snow, a painting by Claude Monet, first of the Impressionists, who concentrated on the rendering of light and atmosphere. This work is in the Tate Gallery, London

tury. Its central principle was that the hand should record exactly as the eye sees as for the first time. All conventions of lighting and composition are ruled out by this formula; so are all attempts to be didactic or to "tell a story." The Impressionist is less concerned with known facts than with pure vision; only the objects in nature, as it appears behind its veil of atmosphere, must be set down. Edouard Manet (*q.v.*) is often acclaimed as the first Impressionist, but this is true only in so far that Impressionism arose out of the *plein air* (*q.v.*) school, of which he was the chief exponent. Manet disregarded many conventional niceties, but he never obliterated form to the extent adopted by the painters who established French Impressionism as now understood.

At the head of these was Claude Monet. Realizing that the play of light and atmosphere had hitherto occupied too little, and form too much, attention from artists, he sought to remedy this by making form wholly subservient to light and atmosphere. Thus his characteristic pictures are pictures of light and atmosphere, with only the vaguest suggestion of form.

It was Monet's work that brought the term Impressionist into use. In 1874 an exhibition of open-air pictures was held by Monet and his friends in the Boulevard des Capucines, which included a picture by him with the title *Impression : Soleil Levant*. This title was seized on by Le Chariervi as a peg on which to hang a string of vitriolic abuse of the

artist and his companions. A series of similar exhibitions quickly followed. Monet's associates and disciples included A. Renoir, C. Pissarro, Berthe Morisot, Mary Cassatt, and Charles Sisley. Degas was really only allied to the group by his revolt against the Romanticist view of life and his modern feeling for movement. Whistler was Impressionistic in his later etchings and his nocturnes; Cézanne, Gauguin, and Van Gogh groped after Impressionist ideals before they were absorbed by Post-Impressionism (*q.v.*), and as the movement gained strength a large number of outside painters were drawn to adopt its outlook and its general principles of colour.

In 1876 Caillebotte, an art connoisseur rather than an artist, began to exhibit with the Impressionists in Paris. He died in 1894, having acquired a fine collection of his friends' works, which he bequeathed to the Luxembourg. Several years before that, the Impressionists had virtually won their battle; but they had also, to some extent, become divided. In 1886, Neo-Impressionism (*q.v.*), under the leadership of Seurat and Signac, had started, and Post-Impressionist influences were beginning to make themselves felt. In 1889 an English group, including Wilson Steer, Walter Sickert, and Francis Bate, held the first Impressionist exhibition in London.

To some extent Impressionism, contemporaneous as it was with the growth of interest in photography, was parallel to photography in its attempt to turn the human

eye into a kind of camera, recording everything in terms of light only. It is fair to say, too, that the revealed limitations of photography served to reveal the limitations of the Impressionist theory, especially as expressed in the pseudo-scientific devices employed by the Neo-Impressionists. Nevertheless the movement, like all vital art movements, "cleared the air" of many outworn conventions.

Imprisonment. In law, any act whereby another's liberty of movement is forcibly interfered with, so that "he hath not liberty to go about his business." If that act is carried out by someone who has not the authority to do so it becomes false imprisonment, and an action for damages for wrongful detention lies, unless justification can be proved. Such detention need not be in a gaol. It may be merely such detention or prevention of freedom of movement as interferes with a man's ordinary avocations, as by locking him in a room, or compelling him to remain somewhere by threat, or even by standing at the end of a cul de sac and refusing to let him pass.

In the commonly accepted sense of the word imprisonment is used for confinement in a properly constituted prison or place of detention by constituted authority. In the U.K. simple punishment was introduced later than penal servitude; persons sentenced to the latter served their sentence in penal settlements and not in prisons. Maximum sentence of imprisonment was usually two years, although when a person was sentenced on several charges he might receive two years' imprisonment on each, and the terms might be ordered to be concurrent.

The Prison Act, 1898, established the triple division of offenders, enabling the court in passing sentence to direct that a prisoner not sentenced to hard labour should be placed in the first or second division. If no direction were given the prisoner was automatically placed in the third division. Persons imprisoned under the Vaccination Acts or convicted of sedition or seditious libel were placed in the first division; but otherwise this system had in practice proved a dead letter, and the class into which any prisoner should fall was usually determined not by the court but by the prison authorities. Prisoners under 21, and star class prisoners, *i.e.* those who had not been previously convicted of serious crime and were not habitual

criminals, received special treatment. Special rules governed the treatment of persons imprisoned for debt or for contempt of court; awaiting trial; appealing, and under sentence of death.

Clauses of the Criminal Justice Act, 1948 (which was based on a 1939 bill dropped on the outbreak of war), abolished hard labour, prison divisions, and penal servitude, leaving imprisonment the only form of prison sentence which could be imposed. See Prison and Prison Reform; Punishment; Reformatory Schools.

Impromptu de Versailles, L'. One-act comedy by Molière. It was planned, written, and acted at Versailles in a week, at Louis XIV's suggestion, in reply to the author's critics. Produced Oct. 14, 1663, it showed Molière, in his own person, discussing the art of acting.

Improvement. A legal term used in connexion with land. A tenant of agricultural land or of trade or business premises may be entitled to compensation for certain improvements carried out by him to the premises. Where a landlord has carried out certain improvements to agricultural land, or to premises controlled by the Rent Restriction Acts, he may be entitled to increase the rent. Improvements to any premises may require permission from the local planning authority and involve the payment of a development charge under the Town and Country Planning Act. Improvements may be carried out on settled land under the Settled Land Acts. The trustees of the settlement may pay, and in some cases may, and in others must, call on the tenant for life to refund the money. See also Betterment; Landlord.

Improvisation (Lat. *improvisus*, unforeseen). Art of composing verses impromptu or without forethought. Though practised by the ancients, it is more especially an Italian art. In the spontaneous rhapsodies of the *Improvisatori* of that country we perceive, says Sismondi, how truly poetry is the immediate language of the soul and of the imagination. Many of the Italian masters of improvisation could produce verse only by improvising—doing so on themes suggested, and often in measures indicated, by their listeners. In music the word is similarly used, meaning performance without the notes having been previously written down. See Jam Session.

Impulse. In physics, the conception of a force acting during a

short time. It is measured as the product of the magnitude of the force and the time during which it acts. With many impacts between bodies, however, it is impossible to calculate the force of the impact, and the impulse is measured by the change of momentum it produces.

Imputation (Lat. *imputare*, to charge to the account of). Theological doctrine of the Calvinist system. It teaches that as the sin of Adam was reckoned to all his descendants, who as a whole sinned in him, so the righteousness of Christ is accounted or imputed to all believers in Him, although they had no share in it. This doctrine plays an important part in all Evangelical theories of the Atonement; but the tendency of theology is to give it less prominence. See Calvinism; Sin.

Imredy, BELA (1891–1946). An Hungarian politician. He was educated at Budapest university and entered the service of the Hungarian national bank, becoming a director in 1929. He was minister of finance 1932–34, and prime minister 1938–39. An ardent pro-German, in March, 1944, he was appointed minister of economic affairs, but lasted only until Aug. Imredy was arrested by Allied troops in 1945 and brought before the people's court in Budapest, accused of war crimes and anti-Jewish acts. He was condemned Nov. 23, and shot Feb. 28, 1946.

im Thurn, SIR EVERARD FERDINAND (1852–1932). British explorer. Son of the banker J. C. im Thurn, he was educated at Marlborough and Exeter College, Oxford. He became director of the British Guiana museum, 1877–82,

and resident magistrate in that colony, 1882–91. He served on the Venezuelan boundary commission, governed Ceylon, 1901–04, and was governor of Fiji and high commissioner of the western Pacific, 1904–10. He was the first to ascend Mt. Roraima, Venezuela. His writings include *Among the Indians of Guiana*, 1883. Knighted in 1905, he died Oct. 8, 1932.

Inagua. Most southerly of the Bahamas, in the British W. Indies. It is 50 m. long by 25 m. wide, and has an area of 670 sq. m. Low-lying, it is fringed with reefs, has salt marshes and good pasture land for ponies and cattle. The principal settlement is Matthew Town, on the S.W. coast of the island, the nearest point to Cuba. Pop. of island, 890. Little Inagua lies about 10 m. off the N. coast. Sparsely populated, it is 8 m. long by 6 m. broad; its area is 35 sq. m.

Inajá Palm (*Maximiliana maritima*). Tall slender tree of the family Palmae, native of S. America. It has long leaves divided featherwise into slender, drooping leaflets. The trunk is 100 ft. or more in height. The flower-spikes are enclosed in woody spathe, 5 ft. or 6 ft. long and 2 ft. broad, so hard that they are used as cooking pots and for baskets and pails.

In articulo mortis (Lat., at the point of death). Term used in English law. Statements made by a man *in articulo mortis*, called a dying declaration, though not on oath, can be given in evidence after his death on the trial of anyone accused of his murder or manslaughter. It must, however, be proved that when the statement was made the dying man had abandoned all hope of recovery.

INCAS AND THEIR CIVILIZATION

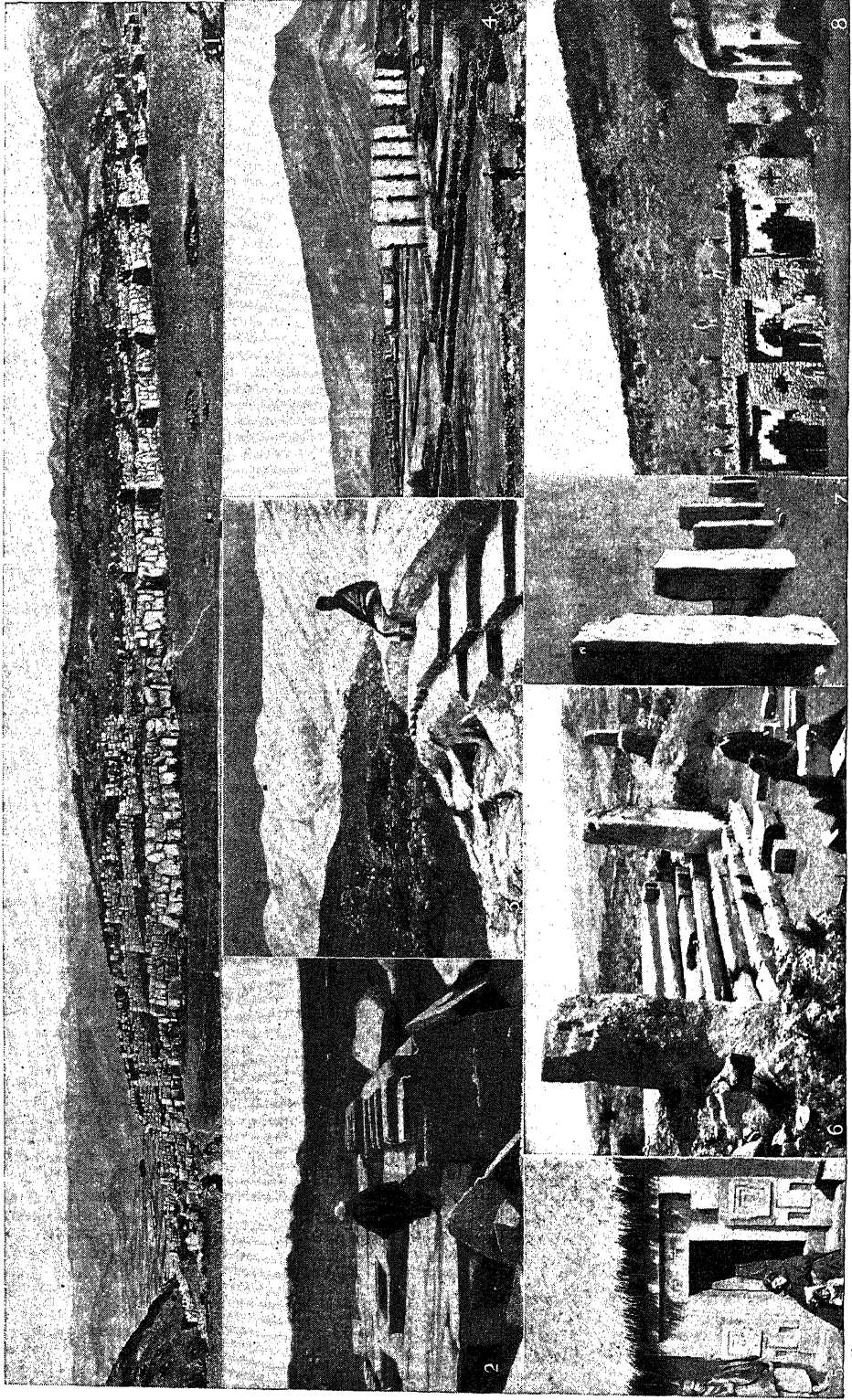
C. R. ENOCK, Author, *The Andes and the Amazon*

In addition see the articles on the various places where there are Inca remains, e.g. Cuzco and Sacahuana, and those on the countries, e.g. Bolivia; Chile; Peru. See also Archaeology; South America

The culture period of the early Peruvians extended from unknown times until its close soon after the conquest of Peru by Pizarro. Judging from the character of its arts and laws, its development, possibly contemporaneous with Chaldean and Egyptian culture, must have taken thousands of years.

Two periods are distinguished—the Inca and the proto-Inca. The Incas, a word meaning in the Quichua language lords, were an hereditary reigning caste or dynasty which flourished for over 300 years under a series of chiefs or emperors. Of this dynasty Manco

Capac—to whom a virgin or miraculous birth was ascribed—was the founder (c. 1240), and the ill-fated Atahualpa, murdered in 1533 by the Spaniards, the last. The Incas were preceded by the Aymaras and by the little-known Andine people, whose existence is borne out by the archaeological remains found throughout Peru and Bolivia. The Inca empire covered a wide area, extending from Quito southwards into N. Chile, and from the Pacific coast westward to beyond the Andes, a region more than 2,000 m. long and 500 m. wide.



1. Ruins of the fortress of Sacsahuana, near Cuzco. 2. Tribunal with platform and judges' seats, Tiahuanaco, Bolivia. 3. Tribunal near Sacsahuana. 4. Ruins of the great temple of Viracocha, Sicuani, Peru. 5. Ancient Inca doorway used in an Indian clay-built house at Tiahuanaco. 6. Stairway and, 7, west wall of the palace of Kala-sosaia, Tiahuanaco. 8. Ruins of Inca palace on the island of the Sun, Lake Titicaca

INCA CIVILIZATION: IMPOSING RELICS OF THE VANISHED CULTURE OF ANCIENT PERU



The Inca historian, Garcilaso de la Vega, son of an Inca princess and a Spanish father, whose accounts form the principal source of our knowledge of the Incas, stated that "the rule of the Incas was more beneficent than that of any Christian monarch," and the social regimen of the early Peruvians was unique in this respect. Their skill and knowledge in building, textile, agricultural, ceramic, and metallurgical and other arts is attested by mural and other remains.

The Inca empire was governed from Cuzco, the capital, situated in a populous valley 11,440 ft. above sea level and now reached by rly. From this point to Quito extended the famous Inca roads, over 1,100 m. long. The importance of these highways has no doubt been exaggerated, as they were of a nature fit only for foot traffic. However, their construction involved rock-cutting and embankments, rivers were crossed by long suspension bridges made of cables of plaited osiers, and swift posts or relay messengers were maintained over them.

The most noteworthy of the megalithic remains at Cuzco is the fortress of Sacsahuana, consisting of a series of walls 1,800 ft. long, forming terraces up the hill-side, and having 20 salients. The masonry is of great worked stones, some 20 ft. high, exhibiting the characteristic



Inca civilization. Remains at Tiahuanaco, Bolivia. 1. A Chullpa. These buildings were more probably habitations than tombs. 2. Idols, probably dating from pre-Inca times. 3. The Gate of the Sun; the reliefs on the left are unfinished, possibly owing to the destruction of the city by earthquake before the building was completed. 4. Details of the sculpture on the same gate. 5. Monolith idol at the south-west corner of the palace of Kala-saia

trapezoidal Inca form. In the same region is the fortress of Ollantaytambo, overlooking the Amazon slope, and the ruins of Intihuatana and Pisac, amid which latter still stands a portion of the stone column by which the Inca priests determined the solstices. Some 400 m. to the N. are the ruins of the

castle of Chavin, and those of Huanuco Viejo, with a series of beautifully built stone doorways. Other numerous remains of fortresses, towers, palaces, sun temples, habitations, etc., are scattered about the uplands.

Of the proto-Inca period the ruins of Tiahuanaco, in Bolivia, near Lake Titicaca, are the principal, and this was probably the chief centre of the earlier culture. Here the monolithic carved doorway of Akapana is a striking feature, and the remains of walls,



stairways, platforms, and stone figures cover a large area. On the coast near Trujillo the ruins of Chan Chan reveal the culture of another advanced people; beautiful pottery was unearthed in this district, some of which is now in the British Museum. This pottery has been described as thousands of years old. Ancient textiles and gold ornaments further attest the skill displayed.

The Incas were skilful agriculturists. They covered some of the mountain slopes with innumerable small terraces for the growing of maize, potatoes, etc.; these *Andenes*, as the Spaniards termed them, still form a striking feature of the landscape. Long irrigation channels were constructed to bring water to the soil, and guano and fish were used as fertilisers.

Social and economic laws were remarkably complete and equitable. Land was apportioned to the needs of the people and the state; taxes were paid in manufactured goods, whose production was regulated; growth of the family was encouraged; all were required to marry, and work was obligatory. There was no monopoly; neighbourly help and intercourse were encouraged or enforced; food was stored against times of famine; destitution did not exist, and colonisation was systematically carried out. Gold was mined but used only for the decoration of temples, or for the royal utensils. The Incas were sun-worshippers, but their religion embodied a belief in the Unknown God who was Creator and pervaded all. There were no human sacrifices.

Whether the early Peruvian culture was autochthonous, or was derived in some way from the Old World in ancient times, has been much discussed. There was no knowledge of the use of iron, no wheat, and the principle of the arch in building was unknown. On the other hand, various points of similarity with the early cultures of Asia and Egypt have been adduced, and it is more than probable that the Chinese landed upon the Pacific coast of America long before the time of Columbus.

Bibliography. Royal Commentaries of Peru, Garcilaso de la Vega, 1688; Rites and Laws of the Incas (Hakluyt series), ed. C. R. Markham, 1873; Conquest of Peru, W. H. Prescott (Everyman's Lib.), 1909; The Incas of Peru, C. R. Markham, 1915; Peru, C. R. Enock, 1915; The Incas and their Industries, H. van den Bergh, 1921; Jungle Paths and Inca Ruins, W. M. McGovern, 1928.

In Camera (Lat., in the chamber). Term used in English law. It means a case heard behind closed doors, the public being excluded. It is a basic principle of English law that all cases shall be heard in public, except when the judge is satisfied that a public hearing would defeat the ends of justice—e.g. in proceedings about a secret process. Among exceptions recently introduced the following may be heard in camera: trials for offences under the Official Secrets Acts (but sentence is pronounced in public); proceedings in juvenile and domestic courts (but the press must be admitted); in suits for nullity of marriage, evidence as to sexual capacity.

Incandescence. State of a body when it has become luminous by virtue of its high temperature. An incandescent mantle is a fabric of highly refractory oxides which glow at a white heat when inserted in a gas flame. Incandescent electric lamps contain fine

threads or filaments of carbon, or more usually tungsten, heated to white heat by the passage of an electric current. The life of these lamps is extended by enclosing the filament in a vacuum or in the atmosphere of an inert gas at a low pressure, so as to reduce the possibility of oxidation.

Incantation (Lat. *incantare*, to enchant). Form of words, usually chanted or intoned and supposed to have supernatural power. The earliest known examples are of Babylonian origin. Incantations, often in the form of doggerel verse, are used in most of the more crude forms of heathen religion, and survive in the folk customs of many Christian countries, as in rhymes used by the peasantry as charms against minor ailments, or to bring fruitfulness to field or orchard. The magicians of old and the necromancers of the Middle Ages made great use of incantations, which were supposed to bind evil spirits, also to heal diseases. See Divination.

INCARNATION: CHRIST AS MAN

Rt. Rev. E. W. Barnes, D.D., F.R.S., Bishop of Birmingham

For the personal aspect of the life of Christ see Jesus Christ. Other questions arising out of that life are dealt with under Atonement and Resurrection. See also Arianism; Christianity; God; Gospels; Holy Spirit; Trinity; Virgin Birth

The Incarnation (Lat. *in carne*, in the flesh) is the fundamental belief of the Christian religion. The doctrine of the Incarnation affirms that in the person of Jesus of Nazareth God was made man that man might know God. All who call themselves Christians, except Unitarians, would accept this statement; and many Unitarians speak of Jesus in such a way as to imply that He stood in a special relation to God. It is impossible to claim that Jesus taught man the true nature of God and showed in His life an example of complete loyalty to God without admitting that between Jesus and God there was an intimate bond.

Revelations of the Gospels

All religious men, who carefully reflect upon the teaching and life of Jesus as they are presented in the Gospels, are attracted by the beauty of character and fineness of spiritual insight there revealed. The idea that Jesus was a mythical invention of the early Church can be dismissed as fantastic. It may be argued with some show of reason that the Jesus of Gospel history is an idealised figure, that the biographers of the Galilean artisan suppressed crudities in His teaching and weaknesses in His

character. Critical inquiry, however, does not support such a contention.

It is now generally agreed that the religious teaching known as the Sermon on the Mount comes from a very early lost document, and that it must accurately mirror the mind and the spiritual confidence of Jesus. Christian scholars scarcely now claim that in all its details S. Mark's narrative must be accepted as accurate; they admit that some of the later material incorporated in the biographies of S. Matthew and S. Luke may be legendary; they hold that the Fourth Gospel had better be regarded as an attempt to explain Jesus rather than as a formal biography of Him. But they remain confident that we can know accurately both what Jesus taught and what He was in Himself—and they affirm that His surpassing spiritual insight and His perfection of character are facts which cannot be denied.

The question then arises: In what relation did Jesus stand to God? If we can speak of all righteous men as sons of God, was Jesus but the noblest of His sons? That would be the decisively Unitarian answer. Those who

accept it hold that in His essential nature Jesus was like other men, though superior to them because of His greater religious insight and moral excellence. But this answer has never satisfied, and still fails to satisfy, the majority of Christians. They find an impassable gulf between moral excellence and moral perfection. They believe that between the spiritual insight of great prophets and the final and complete spiritual certainty of Jesus there is the difference which separates an approach to truth from truth itself. And so they affirm the doctrine of the Incarnation. Jesus was not a son of God, but *the* Son of God. He was God in man made manifest.

To work out the meaning of such simple statements, to explain how God and man could be united in Jesus, is profoundly difficult. No solution of such a problem can ever be adequate. But its importance in Christian theology is such that it cannot be ignored.

"The Son of Man"

Today theologians emphasise first that, alike in the N.T. and in the main stream of Christian theology, the complete humanity of Jesus is affirmed. He was not a demi-god. He was perfect man, and usually spoke of Himself as the Son of man. It is only possible to guess at the original Aramaic phrase which has been so translated. But it is probable that Jesus implied that He was man in the fullest and highest sense of the term. Though Jesus did not, until His trial, publicly claim to be more than this, it is certain that He privately admitted that He was the Christ.

When John the Baptist heard of Jesus's ministry, he sent to inquire whether He was the Messiah, and received an affirmative answer. When Jesus asked His disciples, "Who say ye that I am?" Peter answered, "Thou art the Christ," and Jesus "charged them that they should tell no man of Him." At the trial the high priest asked, "Art Thou the Christ, the Son of the Blessed?" and Jesus said, "I am." When all three statements are considered in connexion with the majestic religious certainty of Jesus, it becomes impossible to doubt His claim to be the Christ.

But, if the conclusions of modern scholars can be trusted, Jesus did not explicitly make greater claims for Himself. The relation to God of the Christ was worked out by His followers, who gradually came to see that He was

the Incarnation of God. Belief in the Resurrection contributed powerfully to this view. Existing accounts of the appearances of Jesus after His death are difficult to understand, partly because the original ending of S. Mark's Gospel has been lost. But there is no doubt that the Apostles were sure that they had seen the Christ.

The Divinity of Christ

S. Paul in later years commonly wrote of the "Lord Jesus Christ." The term "Lord" was applied by pagans to their gods; but the apostle could use it without necessarily implying that Jesus was God. Yet S. Paul was led even more clearly to identify the Spirit of the risen and living Christ with the Spirit of God. When "the grace of the Lord Jesus Christ" is coupled with "the love of God and the fellowship of the Holy Spirit" we have the germ, and probably much more than the germ, of that thought which explained the Incarnation by the doctrine of the Trinity. The Fourth Gospel is now generally regarded as the work of a writer who may have used discourses of the Apostle John, the son of Zebedee, but who certainly was strongly influenced by S. Paul. This writer explains Jesus by saying that the "logos" or Word of God, a pre-existent Being Who from the beginning was with God and was God, "became flesh and dwelt among us." Such is the final Christology of the N.T.

Two particular aspects of modern thought may be mentioned. It has of late been increasingly emphasised that Jesus could not have been perfect man without accepting human limitations. The traditional creeds so strongly insisted upon His Divinity as somewhat to obscure this fact. It is now urged by theologians that He was "very God of very God," but they say that in becoming flesh He necessarily accepted ideas as to history, science, and literature held by His contemporaries.

The Virgin Birth

No finality has, however, been reached as regards the controversy which centres in the Virgin Birth. By uninstructed Christians it is generally thought that the Incarnation is proved by the Virgin Birth, and that those who doubt that miracle cannot, therefore, affirm the Divinity of Christ. This is untrue. If it were a fact that the Incarnation can only be held by those who accept the Virgin Birth, it would be incredible that the miracle is never mentioned in any

extant writings of S. Mark, S. Paul, or S. John. Moreover, if there were conclusive evidence that His mother was a virgin when Jesus was born, and if Jesus had been a commonplace or a bad man, it would obviously be impossible to claim that He was Divine. In short, the miraculous birth at most confirms the fact of the Incarnation.

Theologians who plead to be allowed to suspend judgement as to the manner of Christ's birth point out that the miracle is recorded only in the opening chapters of the first and third Gospels, that these narratives are difficult to harmonise, and that they may possibly have been derived from popular traditions. But it must be observed that doubts as to the truth of the miracle are held in the main by those who accept from modern science the idea that God always works uniformly through nature.

Bibliography. Essays on the Trinity and the Incarnation, ed. A. E. J. Rawlinson, 1928; The Incarnate Lord, L. S. Thornton, 1928; Doctrine of the Incarnation, J. K. Morley, 1936; The Divinity of Jesus Christ, J. M. Creed, 1936; The Person of Jesus Christ, A. E. J. Rawlinson, 1943.

Incarvillea. Small genus of perennial herbs of the family Bignoniaceae. Natives of China and Soviet Central Asia, they have opposite, divided leaves, and large, tubular flowers of rosy or scarlet colour. *I. olgae* is frequently grown in European gardens.

Ince-in-Makerfield. An urban dist. of Lancashire, England. It adjoins the co. bor. of Wigan, but has its own railway station. Industries include rly. wagon works, ironworks, cabinet making, garment works, cotton mills, and collieries. Ince gives its name to a county constituency. Pop. 21,763.

Another Ince is in Cheshire, 7 m. N. of Chester. It has an old manor house, now a farmhouse, once the residence of the abbots of S. Werburgh, Chester. Pop. 277.

Incendiary (Lat. *incendere*, to burn). One who maliciously sets fire to property, especially a building. This is, under most codes of law, a crime, and in England is known as arson and in Scotland as fire-raising. See Arson.

Incendiary Weapons. Bullets, shells, bombs, or other projectiles filled with inflammable materials or chemicals and designed to ignite upon contact with their target. They are distinct from flame weapons (*q.v.*), which consist

of either a flame fed from a reservoir of oil, projected through a nozzle directly at the target (i.e. a flame thrower), or a burning substance thrown or fired against the target (i.e. burning arrows). In the incendiary weapon, the inflammable filling remains inert until combustion is caused by a fuse or by impact.

One of the earliest known uses of incendiary weapons was by the Romans in 250 B.C., during the first Punic War. Earthenware containers filled with chemicals were catapulted against the enemy and ignited on contact with the ground. Early in artillery warfare came a leather or light metal casing, filled with an inflammable liquid, a flint-and-steel or other device igniting the contents when the shell hit the target. Such shells were used in naval warfare to fire ships' rigging. In 1857 the British army adopted a cast-iron shell, lined with loam, and shortly before firing filled with molten cast iron. On impact the case broke up and the molten contents were splashed over the target. In a type invented at the beginning of the 20th century, iron was rendered molten during the passage of the projectile to its target; the shell was provided with either a time or a percussion fuse.

Incendiary Bullet Introduced

The First Great War brought the incendiary bullet designed for use against aircraft. A common type was a cupro-nickel case filled with white phosphorus; when the bullet was fired, friction caused the case to melt, whereupon the phosphorus ignited by exposure. The bullet proved effective when fired into aeroplane petrol tanks or the gasbags of airships. Shells filled with phosphorus or finely powdered iron or magnesium were fired from 4.5-in., 6-in., and 18-pdr. guns; a contact fuse detonated a charge, raising the filling to white heat and scattering it on the target. But greater devastation was wrought by high explosive.

It was the development of the tank and the aeroplane which led to improvement of incendiary weapons in the Second Great War. All the armies employed some form of incendiary anti-tank grenade; in general their design was based on either the Russian self-igniting "Molotov cocktail," first used in the Spanish Civil War, or on the British No. 74 grenade.

The self-igniting grenade was a short-necked half-pint glass bottle, 90 p.c. full of a mixture of yellow

phosphorus, benzene, water, and a 2-in. strip of crude rubber. The remaining space contained air. When thrown against a tank or other armoured vehicle, the glass shattered and the contents of the grenade ignited spontaneously as the oxidised phosphorus fired the benzene. The rubber, which dissolved in the mixture during storage, made the incendiary materials tacky, so that they adhered to the surface against which they spilled. The German Brandflaschen and the Japanese Kaen-Bin were of this type.

Adhesive Grenade

The British No. 74 consisted of a spherical glass or plastic container holding 20 oz. of jellified nitro-glycerine. The container was covered with a woollen jacket steeped in a powerful adhesive. Fixed to the top of the grenade was a wooden Mills handle incorporating a lever in contact with a firing pin. When the safety pin was withdrawn and the grenade thrown, the lever in the handle released the firing pin, which detonated a 5-sec. fuse embedded in the charge. Upon striking its target, the grenade stuck to it, the container was shattered, and the explosive ignited by the fuse.

Several efforts were made to produce an efficient anti-aircraft incendiary, one of the first being the German "flaming onion" (q.v.); this, however, was rather an enlarged tracer bullet, destructive only if the projectile scored a direct hit on the target. The Germans later developed an incendiary A.A. shell, but it proved ineffective.

The incendiary bomb dropped from aircraft developed into the most potent weapon of aerial warfare until the advent of the atomic bomb. In 1939 the standard one used by the R.A.F. weighed 2 lb. 2 oz. Various known as the electron or kilo, shown in the diagram, it consisted of a thin tubular case of magnesium alloy fitted with a composition of thermite A (aluminium iron oxide). During descent the bomb was kept head down by a tail of sheet iron, B. In its head was a detonating pin, C, which upon impact was driven against a percussion cap that in turn fired the igniter, D. As thermite supplies its own oxygen and burns at 3,000° C., the heat fired the magnesium case, which set alight any material except stone, concrete, and steel. The bomb could be extinguished only by smothering it with sand or earth, or

directing against it a spray of water. The Luftwaffe used a similar type of bomb in most attacks on Great Britain, including the fire raid on London, Dec. 29, 1940.

The German air force never equalled the devastating fire raids carried out over Germany by the R.A.F. and the U.S.A.A.F. Japan made comparatively small use of the incendiary, though in the only air raid on the U.S. mainland, Sept. 9, 1942, incendiary bombs from balloons launched from Japan fell harmlessly in an Oregon forest.

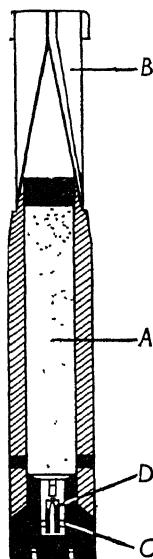
The Allied design of incendiary bombs was modified with the object of rendering their extinction difficult or dangerous; an example was the introduction of sodium compounds, which react violently to the application of water. In 1942 a combination of incendiary and anti-personnel bombs was introduced; it could kill anyone who approached within 50 ft. of where it fell. White phosphorus, with the property of igniting spontaneously when exposed to air, was dropped in thin containers which burst on impact. Solidified oils were used as fillers, pieces of burning oil being thrown around upon detonation.

The Scatter and the Intensive

The incendiary bomb most widely used by the Allies in the latter part of the war weighed 10 lb. and was dropped in containers holding 100. At a predetermined height the container opened

and released the bombs individually. There were two main types, the scatter and the intensive. Bombs filled with viscous and gelatinous materials instead of solid combustibles were also used. One semi-liquid filling consisted of petrol thickened with jelly to prolong burning and ensure adherence of the incendiary substance to walls and ceilings. Thickening petrol with magnesium powder, liquid asphalt, and oil yielded an inflammable mixture of intense heat.

It was found that against



Incendiary Weapons. The bomb known as an electron or kilo

towns and industrial targets incendiaries are potentially more destructive than high explosive. The latter is principally an agent of demolition, its effects strictly limited as to both space and time. Incendiaries act cumulatively, inducing self-destruction of material to produce effects that extend far beyond the point of impact. The limitation of the incendiary bomb is that it must bring fire directly to bear upon a combustible object. If the bomb misses the target it will burn itself out, while a direct hit on a fire-resistant target will be innocuous.

Point bombing was made from a low altitude and needed a large incendiary with good penetrating qualities; it was chiefly directed against isolated targets likely to escape destruction during a conflagration. Area incendiary bombing was normally undertaken from a high altitude. In this operation it was usual to drop four tons of incendiaries per square mile over an area known to contain a high proportion of inflammable targets. From 15 p.c. at the beginning of the Second Great War, the quantity of incendiary bombs increased until by 1945 it was not unusual for a R.A.F. bomber force over Germany to carry 80 p.c. of its load in this form. In the air war against Japan the proportion of incendiary to high explosive bombs dropped was much higher than in Europe. On March 9, 1945, 1,000 tons of incendiaries razed over 15 sq. m. of Tokyo. During the war over 100,000 tons of incendiaries destroyed some 150 sq. m. of Japanese industrial areas. See Air Raids; Bomb.

David Le Roi

Incense. Substance which on burning emits a fragrant odour. It has been used from early times in religious ceremonies. Its hygienic value as a fumigant and in counteracting unpleasant smells was also appreciated. Tertullian (c. 200), discussing the use of incense, stated that whilst he appreciated its value in counteracting unpleasant smells he did not accept it as essential in worship. Records of early Egypt show that incense was used probably in the first Thinite dynasty (3,500 B.C.). Ancient Egyptians obtained their frankincense from the Somali coast, where trees of the *Boswellia* genus which produce it are plentiful. It was used all over East Asia.

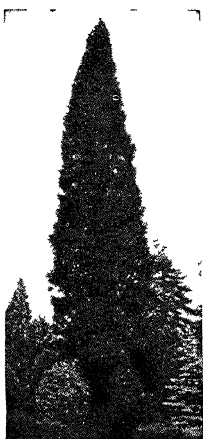
Apart from frankincense, many other resinous substances are used. Sixteen ingredients are

specified in one Egyptian compound, and the blending was carried out with elaborate ceremonial. Among the Jews the use of incense was strictly confined to the priesthood. The O.T. contains a fairly detailed record of the development of the ritual (Ex. 30; Lev. 10; Num. 16; and 2 Chron. 26). The Romans favoured incense in ceremonies and as a fumigant. In the Christian Church incense does not appear officially until about the 5th century, but was probably used earlier as a fumigant. There appears to be no fixed rule as to the composition and manufacture. Rome uses frankincense (*q.v.*); other places prefer benzoin, stearax, cinnamon, etc.

Trees producing suitable substances are plentiful in tropical Asia and in Polynesia. Gum benzoin from Siam and Sumatra is a typical product. Cheaper incenses are prepared from damar resins and from manila copals in Malaya and Indonesia. Apart from *Boswellia* in Somaliland, suitable trees grow in India, particularly in Bihar and on the slopes of the Himalayas, and Bombay exports incense to Europe.

Incense Cedar (*Libocedrus*). Small genus of evergreen trees of the family Coniferae. They are

natives of Asia, Australasia, and America. They have small, scale-like, overlapping leaves, much like those of *Thuja*, and oval cones consisting of four to six flattish scales. Some among the species yield valuable timber, *L. tetragona* (Patagonia)



Incense Cedar, a tree valuable for its timber

being so straight and even-grained that it gives spars and boards of great length, and splits so cleanly that shingles of its wood appear as though they had been planed. *L. doniana* (New Zealand) and *L. chilensis* (Chile) also provide admirable timber; but the wood of *L. bidwillii* (New Zealand) is soft and porous.

Incest (Lat. *in*, not; *castus*, chaste). Carnal knowledge between

a man and one who to his knowledge is his granddaughter, daughter, sister, or mother. It is immaterial whether the relationship is of the whole blood or half blood, or is traced through lawful wedlock. An act of 1908 made incest a crime.

Inch. Form of Celtic word *ennis* or *innis*, an island. The word is commonly found in Scottish place-names, e.g. Inchcape, Inchgarvie, Inchkeith, and Inch Kenneth.

Inch (Lat. *uncia*, a twelfth part). Measure of length. It is the twelfth part of a linear foot. The British halfpenny coin is one inch in diameter. See Weights and Measures.

Inchbald, ELIZABETH (1753-1821). English actress, playwright, and novelist. Born near Bury



Elizabeth Inchbald
After Russell

St. Edmunds, Oct. 15, 1753, daughter of John Simpson, farmer, she married an actor, Joseph Inchbald (d. 1779), in 1772. She acted for a time on the provincial stage, wrote

and adapted plays and farces, and is chiefly remembered as the writer of *A Simple Story*, 1791, and *Nature and Art*, 1796, often reprinted. She died in London, Aug. 1, 1821.

Inchbold, JOHN WILLIAM (1830-88). British painter. Born at Leeds, April 29, 1830, he studied at the R.A. schools. He first exhibited at the Society of British Artists in 1849 and at the R.A. in 1851. John Ruskin's praise of *The Moorland*, 1855, drew attention to his work, which, however, was slow to win general approval. Despite his sympathies with the Pre-Raphaelites, he painted landscape broadly and with intense feeling, his aerial effects and wide horizons being especially fine, but his colouring was uncertain. He died at Headingley, Leeds, Jan. 23, 1888. His volume of verse, *Annus Amoris*, 1877, proved him a poet of merit.

Inchcape, JAMES LYLE MACKAY, 1ST EARL OF (1852-1932). British shipowner and administrator. The son of a shipowner, he was born at Arbroath Sept. 11, 1852. He went to India in 1874 and became partner in a firm of merchants. Chairman of the Bengal chamber of commerce and one of the viceroy's legislative council, he was knighted in 1894

for establishing the gold standard in India. From 1897 he represented commercial interests on the



1st Earl Inchcape
Elliott & Fry

Council of India, negotiating a treaty with China in 1902. Back in England he built up a unique position as a director of the National Provincial Bank, the Anglo-Persian Oil Co., and the G.W.R., and as head until his death of the P. and O. shipping company. He attended the Imperial Conferences of 1907 and 1911. In the First Great War he disposed of many government and ex-enemy ships at favourable terms for the Treasury. He was made a baron 1911, viscount 1924, and earl 1929.

In 1928 his daughter Elsie Mackay was lost on an Atlantic flight, and Inchcape set aside £527,808, which would have been her portion, to accumulate at compound interest for 45 to 50 years and the fund then to be used to reduce the national debt; it was estimated that the sum would amount to £8,500,000. Inchcape died May 23, 1932, and was succeeded in his title and shipping interests by his son Kenneth (1887-1939). The 3rd earl was the latter's son Kenneth (b. Dec. 27, 1917). The heir's title is Viscount Glenapp. A Life of the 1st earl by H. Bolitho appeared in 1936.

Inchcape Rock. Dangerous reef off the coast of Scotland, known also as the Bell Rock. Some 13 m.

due E. of Buddon Ness, Angus, at the mouth of the Firth of Tay, it is 500 yds. long and 100 yds. wide. At ordinary tides it is four ft. above the water, but at spring tides it is submerged 12 ft. A lighthouse was built here by Stevenson in 1807, and the light is one of the most brilliant on the British coast.

In former days a bell tolled by wave action warned the mariner; it is the subject of a ballad by Southey.

Inchcolm. Island in the Firth of Forth, Scotland. Belonging to Fife, it is $1\frac{1}{2}$ m. S. of Aberdeen; its length is about $\frac{1}{2}$ m. and extreme breadth $\frac{1}{8}$ m. Here are the

remains of a monastery established by Alexander I in 1123, which include a square tower, a church, and small octagonal chapter house, all in good preservation; the stone-roofed oratory to the W. is said to have been a hermit's cell. The name means the island of S. Columba. Saint Colme's Inch is referred to in Shakespeare's *Macbeth*.

Inchgarvie. Island in the Firth of Forth, Scotland, belonging to West Lothian. Its castle, built c. 1491 and at one time used as a state prison, was demolished during the construction of the Forth Bridge (*q.v.*), the central support of which rests on the island.

Inchkeith. Island in the Firth of Forth, Scotland, belonging to Fife. It is 4 m. N. of Leith. Acquired by the government from the duke of Buccleuch, it is one of the defences of the Forth. On its highest point is a lighthouse.

Incident (Lat. *in*, on; *cadere*, to fall). Term usually applied to casual events of minor importance. The Incident is the name specially given to an unsuccessful plot formed in 1641 to seize the duke of Hamilton and the earl of Argyll, then leaders of the opposition in Scotland to Charles I.

In the feudal system the word incidents was used for the customary payments made by the holders of land to their lords. These are usually classified as reliefs, aids, and rights of wardship and marriage. Reliefs were payments made on succeeding to an estate; aids were paid on special occasions. (*See Feudalism.*)

The word was also officially used in Civil Defence to indicate an area of air-raid damage and the action necessitated therein.

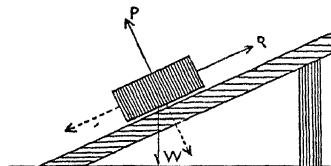
Incinerator (Late Lat. *incinerare*, to reduce to ashes). Destructor in which town or hospital refuse, etc., is consumed by burning. *See* Destructor; Refuse.

Inclined Plane. Plane surface inclined at an angle to the horizon and in theory one of the simple



Inchcolm. Ruins of the Augustinian monastery

fundamental machines. Suppose a body to rest on a frictionless plane. The weight of the body W acts vertically downwards and this force can be resolved into two components, one acting perpendicular to the surface and the other down the surface. The first of these components is balanced by the reaction P , and the force R necessary to prevent the body slid-

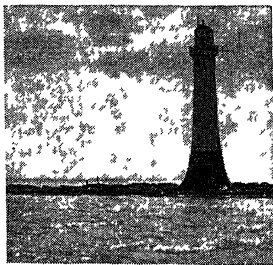


Inclined Plane. Diagram illustrating its mechanical principles. *See* text

ing down the plane must equal the second component. Thus by means of an inclined plane a body may be raised by application of a force only a fraction of its weight.

Inclusion. In mineralogy, any foreign body enclosed within a crystal. Inclusions may be extremely common, large or small, and gaseous, liquid, or solid. They are due to a variety of causes, the most common being rapid crystallisation, crystallisation from impure solutions, or incomplete replacement. Fluid inclusions are often water, frequently brine; carbon dioxide is common, as gas or liquid. Sometimes liquid inclusions contain a movable bubble of gas. The concentration and nature of inclusions sometimes has a profound effect on the appearance of the host mineral, *e.g.* milky and smoky quartz.

To the metallurgist, inclusions are non-metallic particles which find their way into liquid or solid metals. They may arise from reactions in the liquid metal or during solidification. Inclusions tend to be concentrated towards the tops of ingots and at grain boundaries.



Inchcape Rock. The reef and lighthouse in the Firth of Tay
Valentine

INCOME TAX: ESPECIALLY IN THE U.K.

Henry H. Smith, Lecturer on Income Tax Law and Practice

Other items in the national revenue are also the subject of articles in this Encyclopedia, e.g. Customs; Estate Duty; Excise; Super-Tax. See also National Finance; Taxation

In Great Britain an income tax was first imposed by Pitt in 1799, as an extraordinary war measure. It was withdrawn in 1801, but the renewal of the Napoleonic war, in 1803, caused its re imposition until 1816, when it was removed. By 1842, however, a series of deficits compelled Peel to resort to income tax again, with the intention that it should be temporary. The repeal of the import duties prevented its removal at the promised time. The Crimean war in 1857 frustrated the fulfilment of further promises to the same effect, and a levy of tax has continued ever since, the rate fluctuating between 2d. and 10s. in the £.

A differential rate between earned and unearned income was instituted in 1907. Since the inception of the tax, relief has in some years been given by charging a lower rate on part of the income; and in 1909 allowances were introduced whereby relief as to the whole tax on specific sums was given for a wife and children, and in 1918 for housekeeper and dependent relatives.

Remodelled System

The system as it was remodelled in 1920, in accordance with the suggestions of a royal commission, included remission of tax on specified sums under the following heads: for earned income; for a single person; for a married person; for a housekeeper allowance; for children; for dependent relatives. Partial relief was given on life assurance premiums paid on policies on the life of the taxpayer and of his wife. Part of the tax only was chargeable on a limited amount of earned income. Such reliefs are not given to a limited company.

Between 1920 and 1946 the amount of earned income allowed freedom from tax up to a maximum sum, varied between one-fifth and one-tenth, the amount allowed for a single person between £80 and £135, for a married person between £140 and £225, for a housekeeper between £45 and £60, for children between £27 and £60, and for dependent relatives between £25 and £50, reliefs in respect of children and dependents being subject to certain restrictions.

The general scheme of the various Acts relating to income tax is to prescribe rules for the com-

putation of each particular item of income, and then to fix the amount of tax payable according to the sum of all items of income taken together. The purpose is to lay down a standard by which all individuals shall compute their income on the same basis. The intention as regards the tax payable is to take a smaller proportion of a small income than of a large income, of earned income than of unearned income, and of a married man's income than a single man's income, with a combination of these features when applicable.

Income derived from the ownership of lands, houses, etc. (schedule A), is arrived at as follows: First ascertain what the letting value of the property is in the open market, known as the rack rent, if the landlord is to bear the cost of repairs and if the tenant is to pay the occupier's rates. From the rack rent deduct the following allowances for repairs.

(1) HOUSES	ALLOWANCE
where the Assessment does not exceed £40 ..	one-fourth
is £40 to £50 ..	£10
exceeds £50 but not £100 ..	one-fifth
exceeds £100 ..	£20 plus one-sixth of excess over £100

(2) LAND (all cases) .. one-eighth

If land tax is payable, the amount thereof is taken as further reducing the income.

If the actual rent exceeds the rack rent, the actual rent is taken, the repairs allowances calculated on the scale set out above, the net assessment determined on the rack rental basis deducted, any excess being assessed as excess rent.

From Occupation of Lands

A second class of income is from the occupation of lands chargeable upon the occupier (schedule B). It is presumed that the average small farmer does not keep accounts, and the profits of this class of taxpayer are assumed to be a sum equal to three times the gross annual value of the land. If, however, the annual value exceeds £100, the basis of assessment must be on the results of the farming as disclosed by accounts, and the assessment is made under schedule D. A farmer the gross annual value of whose land does not ex-

ceed £100 may elect to be assessed on the profit shown by accounts.

For some years up to 1926, earned income was assessed at the average of the three years before the year of assessment. Then, until 1944, the general basis of assessment was the earnings of the preceding year. In 1944 a scheme of pay-as-you-earn was introduced, the result of which was that the actual income of the year of assessment became the basis of assessment. A claim to set off against the earnings any expenses necessarily incurred in earning the income can be made.

Trades and Professions

Incomes from trades and professions (schedule D) are charged on the basis of the profits of the preceding year, with special provision relating to the first three years of a new business and the last two years of a business which ceases to be carried on by its owner. For the purpose of schedule D, the taxpayer must calculate his profits according to the normal business methods so long as he makes no charge for capital, personal, and irrelevant matters. The items in connexion with which difficulty is most frequently experienced are:

Not allowable: capital expenditure, or losses; expenditure in obtaining capital; repairs in making good a second-hand asset purchased; annual payments of interest and the like; costs of taking a lease of premises; premiums on leases; domestic and personal expenses; proprietors' salaries; drawings; income tax paid; charitable donations, except to benefit employees by subscriptions to hospitals, etc.; losses recoverable under insurance; life assurance premiums; expenditure for alteration of premises so far as such cost effects an improvement of the premises; depreciation; ground rents; costs of travelling to and from business; penal liabilities such as fines for breach of legal regulations; losses on investments; removal expenses where removal is voluntary; but cost of removal of stock is allowed; subscriptions to trade associations, unless the organization has an arrangement with the inland revenue.

Allowable: rent; rates; travelling; ordinary insurances, such as fire, glass, burglary, fidelity, workmen's compensation, national insurance; losses of uninsured stock, employer's liability claims (unless covered by insurance); contributions to superannuation fund, subject to certain conditions.

Wear and tear allowances can be claimed on plant and machinery, industrial buildings, fixtures and fittings, with special provision for initial allowances on plant acquired after April, 1944, and an annual allowance on industrial buildings acquired before that date, with balancing allowances when the asset is disposed of. Capital expenditure on scientific research is allowed in the form of five equal annual instalments. Allowances may be made in respect of capital expenditure on patents incurred after April, 1946. In general such expenditure is allowed by equal annual instalments over 17 years, or equally over any shorter number of years the patent has to run.

Taking the year 1946-47 as typical, the total income having been ascertained, the tax due in the case of any individual was calculated by the following rules:

The aggregate income was reduced by the earned income relief of one-eighth on the portion of the income that was earned. A taxpayer who, or whose spouse, was over 65 years of age at the beginning of the tax year, and whose total income did not exceed £500, was allowed age relief on his total income at the same rate as earned income relief.

Personal Allowances

Taxable income was further reduced, as was appropriate to the individual case, by (1) a personal allowance of £180 in the case of a taxpayer whose wife lives with him, and £110 in any other case; where a married woman earned part of the joint income, a further allowance up to £110 was given on the joint income; (2) an allowance of £50 for each child under 16, or over 16 if receiving full-time instruction at an educational establishment; the allowance applied to adopted children and step-children, but no deduction could be claimed for a child having income in his or her own right exceeding £50 a year; (3) an allowance of £50 to a widow(er) for a house-keeper; (4) an allowance up to £50 for a dependent relative incapacitated by old age or infirmity whose income was less than £80; the amount of the allowance being dependent upon what income the relative had in excess of £30; there was no relief if such income exceeded £80; (5) £25 allowance for a daughter kept at home to attend to an infirm parent.

After the deduction of these allowances, the balance was liable to tax as to the first £50 at 3s. in

the £, the next £75 at 6s. in the £, and the remainder at 9s. in the £. From the tax so calculated the taxpayer was allowed a relief of 3s. 6d. in the £ on all life assurance premiums paid out on policies on his own life and his wife's, subject to the limitations that the premiums did not exceed 7 p.c. of the sum assured, as applied to each policy separately, and that the total premiums did not exceed one-sixth of the total income.

An income of £120 was exempt, and up to £135 the tax might not exceed one quarter of the income in excess of £120.

Income Tax Outside the U.K.

Laws relating to income tax in the U.K. do not apply to the Isle of Man (which levies income tax for internal finance ranging from 3s. in the £ on incomes under £500 to 5s. 6d. on incomes over £5,000) or to the Channel Is., neither being bound by Acts of the imperial parliament unless specially mentioned in them. The British dominions have income taxes of varying incidence, and so have most of the western countries of Europe. The U.S.A. had an income tax in 1863-71, but an attempt to reimpose it in 1894 was resisted, and it was not levied again until after the ratification in 1913 of the 16th amendment, which runs; "The Congress shall have power to lay and collect taxes on incomes, from whatever sources derived, without apportionment among the several states, and without regard to any census or enumeration."

Relief from British tax may be obtained where tax has also been charged in a British dominion in respect of the same income. Special arrangements with Eire give a resident in that country exemption from British tax on profits earned in the U.K., and vice versa. Reciprocal arrangements exist with most of the dominions for relief from double taxation; and a convention between the U.K. and the U.S.A., ratified on July 25, 1946, gave relief from double taxation as between these countries.

Consult Public Finance, E. R. A. Seligman, 1926; *Income Tax in the Napoleonic Wars*, A.-H. Jones, 1939; *Income Tax Law and Practice*, Newport, 18th ed., 1947.

Incommensurable Quantities.

Quantities or magnitudes which have no common measure definitely determinable. Thus the circumference of a circle is incommensurable with its diameter, because the ratio of the two measurements is a magnitude usually indicated by π

which cannot be precisely determined.

Increment. Word meaning an increase, an amount added. Thus a salary scale may provide annual increments of £25; a house purchased for £1,300 may be sold for £2,000, yielding an increment of £700. The word in mathematics denotes the amount by which a variable is increased or changed; thus, a measurable increase in the quantity x may be represented by the symbol Δx (read as delta x); if the increase becomes indefinitely small it may be represented by the symbol dx (read as dee x).

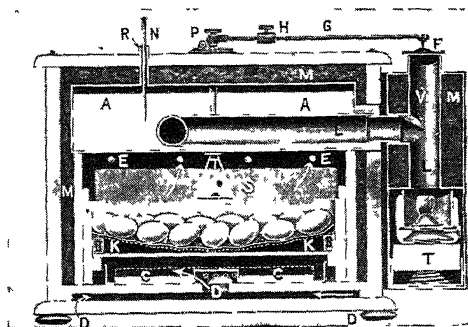
Unearned increment is an additional value that may attach to property merely through a change of circumstances or the lapse of time. Land originally bought for a small sum as agricultural land may after the construction of a main road become valuable as a site for shops, houses, or factories.

Since the publication of Henry George's *Progress and Poverty*, 1879, various methods have been suggested of enabling the community and not the private individual to benefit from this increase in value. Under the Town and Country Planning Act, 1947, all rights of developing land or buildings were transferred to the state. A sum of £300,000,000 was set aside to compensate owners for this loss. Before land or buildings can be developed permission must be obtained and in most cases a development charge paid.

Incubation (Lat. *incubare*, to sit upon or brood). Natural process by which birds stimulate by warmth from their bodies the activity of the germ in the eggs, and its continued development until the chick is ready for hatching. The process is not entirely restricted to birds, the duck-bill among mammals laying and incubating its eggs; and among insects the earwig and a tree-bug appear to brood.

In recent years chickens have been incubated largely by artificial means, the eggs being placed in a well ventilated box and kept at the requisite temperature by means of a current of warm air, or by radiation from a tank of hot water. Several forms of commercial incubators are on the market, but their principle is the same.

Incubators should have a temperature of 103° F. before eggs are placed inside. Correct moisture content of air is 55 p.c. Eggs must be placed evenly, each marked X on one side and O on the other. Eggs should remain



Incubation. Incubator for hatching hens' eggs. A, tank of water; B, egg tray; C, water tray; D, holes for fresh air; E, ventilating holes; F, damper; G, lever; H, lead weight; K, slips of wood; L, chimney and flue; M, non-conducting material; N, thermometer; O, needle for communicating the expansion of S to the lever G; P, middle-head screw; R, filling tube; S, thermostatic capsule; T, lamp; V, chimney

Hearson's Egg Incubator, by courtesy of Spratt's Patent, Ltd.

undisturbed for two days, and thereafter turned three times daily. After 18 days they should be left alone until chicks are hatched. On seventh and fourteenth days eggs should be tested and non-fertiles removed. Incubators must rest firmly and jarring or shaking must be prevented.

HOSPITALS. The principle is now generally applied to the rearing of infants of premature birth, or such as are considered to have little chance of survival under the usual conditions. The child is laid in a basket-bed in a closed chamber air-conditioned at the optimum temperature.

In bacteriological laboratories a somewhat similar method is adopted for the purpose of keeping the cultures under observation at the most favourable temperature. As a medical term, incubation indicates the interval between infection and the appearance of the symptoms of a disease.

INCUBATION PERIOD OF DISEASE. The following are usual:

- Influenza: 3 to 4 days.
- Diphtheria: 2 to 7 days.
- Whooping Cough: 7 to 10 days.
- Scarlet Fever: 1 to 10 days, or more.
- German Measles: 14 days or more.
- Smallpox: 9 to 12 days, but may be as long as 20 days.
- Chicken Pox: 10 to 15 days.
- Measles: 7 to 18 days.
- Mumps: 14 to 21 days.
- Typhoid Fever: 8 to 14 days, but may be as long as 23 days.

Incumbent (Lat. *incumbere*, to rest on, remain in). One who holds an ecclesiastical benefice. Institution to a benefice involving the cure of souls is for life. An incumbent can be deprived only for grave offences against ecclesiastical

or moral law, such as simony, heresy, demanding payment for the Sacraments, conviction for felony, or adultery. On the other hand, he can relinquish his charge only by resignation subject to the permission of the bishop of the diocese. He possesses a life freehold of the glebe and other properties of the living, and can prevent by legal process any other clergyman from

officiating in his parish. He is ex-officio chairman of all vestry meetings, and responsible for the registers of baptisms, marriages, and burials.

Incumbrance (late Lat. *combrus*, obstacle). English legal term. It means a burden attached to any property in such a way that into whosoever hands the property comes the burden remains attached. Thus mortgages, liens, charges are incumbrances, and there is no limit to them. A person making an agreement to sell property impliedly promises to sell it free from incumbrances, and if any are discovered before the conveyance, he must clear them off before conveying.

Incunabula (Lat., cradle, birth-place). Name given to early printed books, more specifically those printed before 1500; hence, generally, books belonging to the infancy of the art of printing. See Book; Printing.

Indecency. Various offences against English law. The principal are indecent assault; indecent exposure of the person; selling or procuring for sale or exposing for sale indecent books or prints.

Indemnity (Lat. *in*, not; *damnum*, loss). Legally, an undertaking to make good monetary loss or damage. Contracts to indemnify persons against possible loss are frequently made in business circles, fire insurance policies being of this nature. An Act of Indemnity can be passed to relieve persons who have unwittingly broken the law from the penalties incurred. There have been many in English history: e.g. in 1920, one granting indemnity to those who had carried out duties for the purpose of maintaining order and discipline during the First Great

War. Another protected officials who had exceeded their powers in Ireland during the "troubles."

A war indemnity is the money paid by a country after the conclusion of a war to its victorious opponent or opponents, ostensibly as compensation for the damage done. After the Franco-Prussian War, Germany in 1871 demanded an indemnity of £200,000,000 from France. The treaty of Versailles in 1919 required a large sum to be paid by the Germans to the Allies, and this was fixed in 1921 at £11,300,000,000, to be paid over 42 years; a duty of 12 p.c. on all German exports was to be levied for the same period. The Germans later declaring themselves unable to pay, the amount was reduced to £6,600,000,000. After the Second Great War Finland, Italy, Hungary, Bulgaria, and Rumania, under treaties signed in 1947, agreed to pay indemnities ranging from \$300,000,000 each by Finland and Rumania to the U.S.S.R. to \$5,000,000 by Italy to Albania.

Indene (C₉H₈). A hydrocarbon which occurs in coal-tar. It is separated from crude benzene by means of picric acid. Indene is a colourless, oily liquid which on oxidation with nitric acid is converted into phthalic acid.

Indent (late Lat. *indentare*, to notch). In commercial language, an order for goods given by an agent abroad, including full particulars about price, etc. Such orders were formerly written on forms in a zigzag or indented fashion from a counterfoil, hence the name. The object was to prevent forgery, but speedier means of spreading commercial information have made it less necessary, and indents are now merely orders for goods. See Invoice.

Indented. In heraldry, a line of demarcation, similar to dancetté (*q.v.*), but smaller. In typography, an indented line is one not set fully to the left-hand margin, e.g. the first line of a paragraph.

Indenture. Term of English law. Formerly, when a deed was entered into between two parties it was written in duplicate upon one piece of parchment, and then the two parts were severed so as to leave an indented or wavy edge, forging being thus rendered difficult. The practice has long since ceased, but still a deed made between two or more parties, e.g. a vendor and a purchaser, always begins with the words "this indenture." A deed made by one party, e.g. a power of attorney, is called a deed poll, because formerly instead

of an indented edge it had a polled or clean-shaven edge.

Independence. City of Kansas, U.S.A., the co. seat of Montgomery co. It stands on the Verdigris and Elk rivers, 160 m. S.S.W. of Kansas City, and is served by rlys. Situated in an agricultural, natural gas, and oil region, it is the headquarters of several oil companies, manufactures oil well equipment, washing machines, revolving doors, alfalfa meal, glass, asphalt, and Portland cement and has flour, cotton, and paper mills, ironworks, and machine shops. It became a city in 1872. Pop. 11,565.

Independence. A city of Missouri, U.S.A. It stands just E. of Kansas City and is a co. seat of Jackson co. Largely a residential district for business men, it is served by the Missouri Pacific and other rlys. President Truman passed his boyhood here. The city makes steel, harvester combines, stoves, petroleum products, and Portland cement, and engages in flour milling, fruit canning, and oil refining. Settled in 1827, it became a city in the gold rush year 1849. It was a point of departure for wagon trains for Oregon and California and for the first overland mail coach to the West. Joseph Smith and 1,500 Mormons or Latter Day Saints established here their New Jerusalem, 1831-39. In 1867-69 Mormons from Utah settled here, and the sect is today the largest religious group in a pop. of 16,066.

Independence Day. A legal holiday observed annually throughout the U.S.A. on July 4 in commemoration of the adoption of the Declaration of Independence by the second Continental Congress on that date in 1776. It is more commonly known as "the Fourth." As a popular holiday, it is kept e.g. by excursions to the seaside. As an historic commemoration, it is celebrated by special services in churches, parades, and functions at which

patriotic orations are delivered. Fireworks are let off on a scale far exceeding anything known in England on Guy Fawkes' Day. An investigation in 1930 showed that during the previous 30 years firework accidents on the Fourth had caused the death of more Americans than the War of the Revolution itself. See Declaration of Independence.

Independent Labour Party. British Socialist organization. It was inaugurated at Bradford, Jan. 13, 1893 to make the trade unions of Great Britain and the Socialist parties (I.L.P., Social Democratic Federation, and Fabians) a distinct body for securing direct Labour and Socialist parliamentary representation. One of its objects was to secure common ownership of the means of life. Its leader was James Keir Hardie, the secretary being J. Ramsay MacDonald. It remained a small but influential left wing of the growing British Socialist movement after the formation of the Labour party in 1906, reaching its peak in 1923-24 when MacDonald became prime minister of the first Labour government and Philip Snowden, another member, was chancellor of the exchequer. The I.L.P. was against both Great Wars, taking the view that they were waged in the interests of capitalism and imperialism. James Maxton virtually led the party from 1928 until his death in 1946. His successor, J. Carmichael,

last remaining member of the I.L.P. in the house of commons, joined the Labour party in 1947. The I.L.P. publishes the Socialist Leader (weekly) and Left (monthly) and runs the National Labour Press. The offices are at 318, Regent's Park Road, London, N.3.

Independents. Name given to a religious body in Great Britain and America, now better known as Congregationalists. They arose in the time of Elizabeth as protesters against the excessive interference of the state in matters of church government, but did not assume the distinctive name of Independents until later. Some went to America early in the 17th century and planted independent churches. In England the Independents exercised great power during the Commonwealth, but afterwards their political influence declined. See Brownists; Congregationalism.

Indeterminate Form. Term in mathematics, for a function or expression of a variable which may have a number of values or an indeterminate value for some particular value of the variable. The infinitesimal calculus deals with the limiting values of such functions. See Calculus; Mathematics.

Index (Lat.). List, digest, or analytical analysis of a book. It should be systematically alphabetical and bring together all the items on a kindred subject mentioned in the book to which it is attached. It should, in fine, perform in regard to the book the service a dictionary renders as a guide to the words in a language.

The word index, used by Cicero in the sense of syllabus, has come into general use in English since the latter part of the 17th century, before which such words as pye or pie (from the Greek word *pinax*, meaning register or list), calendar, catalogue, inventory, register, summary, table, and syllabus are found. Notable indexes are those by H. B. Wheatley to Pepys's Diary; Dr. Birkbeck Hill, to Boswell's Life of Johnson, Boswell's Letters, and the Johnson Miscellanies; J. W. Wheeler, to The Spectator; the various indexes to The Times; and those to the journals of the house of commons, the calendars of state papers, parliamentary papers, and the statutes of the realm. Indexes are provided to the transactions of learned societies; and some library catalogues have subject indexes.

Index. In engineering, anything used or designed to guide or point out, like the pointer of an astronomical instrument, or the

Independence. Facsimile of the signatures appended to the Declaration of American Independence, Aug. 2, 1776

hand of a clock. In surveying, an index is a brass rule accompanying a plane table and having at each end sight vanes. The surveying term index error is applied to a theodolite in which the line of sight to a fixed object is truly horizontal but the vertical circle does not read zero; the angle thus registered is the index error of the instrument. In a watch, the index is the small lever controlling the balance spring, by which the rate of movement of the watch can be adjusted.

Index. In mathematics, a symbol denoting the power to which a quantity has been raised. *See* Indices.

Index Finger. The finger next in order to the thumb, so called because it is generally used for pointing or indicating. *See* Hand.

Indexing. A good index is a necessary corollary to a good book. The art is of comparatively modern growth. The earliest attempt at indexing a book took the form of an abstract of contents in the order of the book itself. Adherence to strict alphabetisation was attained slowly.

The initial fault to be avoided in making an index is the use of A, An, and The (an exception is in an index of first lines of verse). Next comes the inclusion of unimportant words. Other pitfalls are repetition, the misuse of cross references, the placing of persons referred to under their Christian names, or the opening words of their titles, the introduction of classification instead of adherence to complete alphabetisation, and the use of more than one alphabet.

The abbreviation St. (saint) should be inserted as if the word saint were spelt out. The same person should not be referred to under different names. Considerable demands are made upon an indexer in regard to the entries of foreign names—*see* in this connexion the entry under De in this Encyclopedia—especially Indian names. The use of dashes (—) to avoid repetition of the opening words of an entry has dangers, as in the notorious example of

Mill on Liberty

— on the Floss,

or the equally misleading

Lead Kindly Light

— Poisoning

Each class of index has its peculiar problems. The indexing of library catalogues, where the aim is the bringing together of books on kindred subjects, is made specially difficult by the fact that titles of books are not always

certain guides to their contents. If the indexed page is large, it should be divided into four sections, *a*, *b*, *c*, and *d*, a practice adopted in the index to the Encyclopedia Britannica; or, as with The Times newspaper index, each column should have a distinctive letter.

When the work to be indexed is in several volumes, each volume should be indicated by small Roman numerals, the page in Arabic figures.

An Index Society, formed in 1877, published a variety of indexes, 1879–91, and was amalgamated with the Index Library. Proposals have been made for state-aided indexes to general literature. *See* Catalogue; Concordance; Dictionary; Lexicon.

Index Librorum Prohibitorium (Lat., list of prohibited books). Catalogue of books the reading of which by the faithful is prohibited in the R.C. Church. This right of prohibition was claimed in 398 by a council of Carthage, and a list of banned works was issued in Rome by Pope Gelasius in 494. The first important catalogue was produced by the council of Trent and published by Pius IV in 1557–59. The Index was republished by Clement VIII in 1595, since which date various new editions have appeared. The Index is the work of the Congregation of the Index, which, as reorganized by Benedict XIV in 1753, prohibits works considered immoral or subversive of faith.

Index Number. Device used in statistical calculations. These numbers are not only averages of different measurements, but also comparisons between such averages and others of a similar nature made at different times. If the average price of a certain commodity was 5s. in 1945, 5s. 6d. in 1946, and 6s. in 1947, then with 1945 as the base year, the following price index numbers will indicate the changes: 1945, 100; 1946, 110; 1947, 120.

The compilation of index numbers can be undertaken successfully only by competent statisticians. Although Italy began to compile index numbers during the late 18th century, England has led the world in this matter. The

first newspaper to publish index numbers was The Economist. Pioneers of development were Newmarch, Sauerbeck, Jevons, Wood, and Bowley. To these men England owed her dominant position in statistics, which was later challenged by the U.S.A.

The monthly digest of statistics (H.M.S.O.) contains tables of index numbers relating to industrial production, employment, transport, exchange rates, gold reserves, bank deposits, wages, prices, exports and imports, and cost of living. Similar information for countries comprising the United Nations is published monthly by the Bureau de Statistique des Nations Unies. The London and Cambridge economic service supplies subscribers with an index of production and of wages. The Statist and The Economist publish their own index numbers on wholesale prices; the Chamber of Shipping, on freights; the Actuaries' Index, Bankers' Magazine, and Investors' Chronicle, on investment; the Financial Times, on general financial matters.

Perhaps the most important use of index numbers is that of stabilising the purchasing power of money. Currency so stabilised is called managed currency. Under the gold standard, the amount of currency in circulation varied with the amount of gold held as security; excess of currency over demand for it was reflected in high prices and inflation. Under a managed currency, the price level can be kept constant by the issue of more currency when the index number falls, and the restriction of issue when it rises. Another use is in making international comparisons of social conditions.

Index numbers relating to the cost of living were long used in the U.K. as a basis for the adjustment of the wages of hundreds of thousands of workers (*see* Cost of Living). Appended is a table giving the changes in the cost of living of a few countries between 1938 and 1946.

J. E. Bruton, B.Sc. (Econ.)

INDEX NUMBERS:

Cost of Living (food items): Base Year, 1937=100

	1938	1939	1945	1946
Germany, British Zone	100	100	115	120
United Kingdom ..	101	101	122	122
Australia ..	104	109	121	122
Canada ..	101	97	129	136
South Africa ..	105	104	147	151
United States ..	93	90	132	152
France ..	116	125	436	746
Poland ..	95	97	11,500	12,809
China ..	129	172	24,978	337,601

INDIA: VAST SUB-CONTINENT OF ASIA

A D INNES Author *History of the British in India* and A SABONADIERE late ICS

This article is concerned with the whole sub continent historically known as India including both the self governing dominion of the same name and that of Pakistan as well as princely and other states and the territories associated with France and Portugal. Geographically and historically, the sub continent is treated as a single entity, an account of its earlier history being immediately followed by the separate story of India as a unit of British imperial rule 1858-1947. This Encyclopedia also contains hundreds of shorter articles on the various states, divisions, cities, rivers and mountains of India. See also Indian Air Force, Indian Army, Indian Navy etc.

The sub continent of India is situated near the centre of the S. part of Asia, partly within the tropics. It has a total area of 1,581,410 sq m and is divided into the Indian Union and the dominion of Pakistan (which include many former states and agencies), and small areas colonised by France and Portugal. It is shaped like a quadrilateral with curved sides. The N N E side is formed by the Himalayas. From Assam in the N E, the S E side begins with the mountains separating Assam from Burma, and then, after these approach the sea, it is formed by the Bay of Bengal down to Cape Comorin. The W S W side is bounded by the Arabian Sea from Cape Comorin to the approaches to the Persian Gulf. The N W side is the chain of mountains between India and Afghanistan, which, like the Himalayas, runs from the great mountainous knot called the roof of the world. The states of Nepal, Bhutan, and Sikkim, which for most of their length run from the crest of the Himalayas to below the foothills, form the S E end of the N E side of the quadrilateral. N and E of them is Tibet.

Mountain Systems

At a few places Indian districts bordering on these three states include the foothills, and at Darjeeling between Bhutan and Nepal the lower Himalayas are in India. The W boundary of Nepal is at about long 80° E, N W of which the Himalayas up to the main ridge are in the territory of the Union of India. At the extreme N, the mountain state of Kashmir actually goes beyond the main chain. W of the Indus, the boundary between Pakistan on the one side and Afghanistan on the other lies amid the Sulaman and other ranges of hills, some of which attain a height of over 10,000 ft. Beyond the main ridge, and near the farthest point of Pakistan to the W, lies Quetta at an elevation of over 5,000 ft. The hills diminish in altitude as they near the Arabian Sea.

In Tibet to the N of the W end of Nepal rises the river Sutlej, and round about its source in a circle

of about 100 m are to be found headwaters of four other principal rivers of the sub continent, the Indus, the Brahmaputra, the Ganges, and the Jumna. The Brahmaputra for a great part of its course flows to the E on the N side of the main chain of the Himalayas through Tibet. About long 95° E it turns S, and cuts through the Himalayas into Assam, then turning W S W, and, after passing the Garo Hills, S into the plain of lower Bengal, where the many streams of the delta make water travel an easy means of communication over much of Eastern Bengal. From Tibet the Indus flows N W right through Kashmir, and then turns S S W and maintains that general direction. The Sutlej cuts its way through the Himalayas to the S W and preserves that direction through the plains until it reaches the Indus. Of its many tributaries the principal are the Beas and the Chenab, the latter itself having two large tributaries, the Ravi and the Jhelum.

Irrigation Canals

The Ganges, and the Jumna to its W, cut through the Himalayas in a generally S direction, and curve round into a generally S E course, the Jumna flowing into the Ganges at Allahabad. The next most important Himalayan tributary of the Ganges is the Sarda Gogra. Irrigation canals of great length, adding immensely to the agricultural wealth of the country, and saving much distress in dry years, have been constructed, taking their water from the Ganges, Jumna, Indus, and Punjab rivers. From the Bay of Bengal on the E, and from the Arabian Sea on the W, the land gradually rises along the valleys of the Ganges and the Indus to the Punjab, at the rate of about a foot a mile, the plains of the two river systems are a continuous tract of alluvial, stoneless country.

This flat country is bounded to the S E of the Indus valley by the Aravalis Hills, the N E point of which is the famous Ridge at Delhi on the Jumna. S E from Delhi a fringe of hills follows generally the same trend as the Ganges

and Jumna, and runs down to the Ganges at some points. The easternmost of these are the Rajmahal Hills, after passing which the Ganges turns decidedly to the S. Standing a little W of the southerly ridges of the Aravalis is Mt Abu, 5,653 ft high. S of the Aravalis is a series of confused hills and ridges merging southwards into the Western Ghats, at places exceed 2,000 ft. On the other side of India are the Eastern Ghats, a less elevated range, and between them and the coast there are many large stretches of alluvial country. The Mysore plateau lies between the southerly portions of the Western and Eastern Ghats. Still farther S are the Nilgiri Hills, not far from the W coast, rising to over 8,000 ft. At the extreme S of India, terminating in C Comorin, are the hills of Travancore.

The S part of India, the eroded plateau of the Deccan, is thus an irregular quadrilateral pointed sharply S. Across this area run other ranges, notably the Vindhya and Satpuras on either side of the river Nerbada. But the whole of it abounds in stony hills of all colours and formations, some bare, some forest clad. Among them are plains and valleys in some of which the soil is fertile, yielding excellent crops, while in others the soil is poor.

Rivers Flowing East

Owing to the height of the Western Ghats and the tilt of the plateau, most of the Deccan rivers flow east. Only two principal streams break through the western hills and reach the Arabian Sea, the Nerbada and the Tapti. From Rajputana the Chambal and its many tributaries, and farther E the Betwa and the Ken, flow into the Jumna, the Son and the Barak find their way to the Ganges. Three large rivers, the Mahanadi, the Godavari, and the Krishna, cut through the Eastern Ghats and flow into the Bay of Bengal. S of the Krishna the two Pennars and the Kaveri water the alluvial country between the Eastern Ghats and the sea.

The tropic of Cancer lies to the S of the Indus delta and cuts



1. Todas man from the Nilgiri Hills. 2. Kotas man, Nilgiri Hills. 3. Kling, from Malaysia and Farther India. 4. Parsee woman. 5. Malabar woman of Tiyan caste. 6. Bhil woman. 7. Lepcha, from Sikkim. 8. Hindu

brass-worker, Benares. 9. Lepcha woman. 10. Hindu woman, from Calcutta. 11. Rajput. 12. Tamil woman. 13. Sikh. 14. High caste Brahmin fakir, wearing the sacred thread. 15. Bengali woman.

INDIA: TYPES OF SOME OF THE MANY RACES INHABITING THE SUB-CONTINENT

across the delta of the Ganges and Brahmaputra. All India N. of this line, therefore, including the flat Ganges-Indus plain, lies outside the tropics. The sub-continent of India extends through some 30° of lat. and contains many climates. Bengal and the Ganges delta are green all the year round. In May, when the greater part of the plain is getting dry and dusty, frequent showers usually fall in Bengal, keeping the country green until the monsoon breaks. But Sind on the lower course of the Indus is nearly as dry and rainless as Egypt, and there May and June bring a fierce dry heat. Jacobabad recorded a shade temperature of 126° F. in 1897. On the other hand, in winter Sind has really cold nights, far colder than those of the same lat. in Bengal.

In the Ganges-Indus plain generally there are three well-marked seasons, the rains from mid-June or early July till Oct., the cold weather from about Nov. to mid-March, and the hot weather from mid-March till the break of the rains. The farther from the Bay of Bengal the longer and more pronounced is the cold weather. Slight frost at night is common in winter in the Punjab. Even in the Ganges-Jumna part of the plain there can be sharp frost, as in Jan., 1905, when three days of frost did severe damage to growing crops. Wheat, barley, gram, and some other crops are harvested as the cold weather merges into the hot, and then agriculture mostly has a rest until the rains come. A failure of the rains, even in Sept. and Oct., is disastrous. Then the autumn crops are withered, and no ploughing can be done for the spring crops in unirrigated soil. The causes of failure of the rains are not quite clear. Snowfall in the Himalayas, barometric pressure in the Indian Ocean and in S. America, and sun-spots, all seem to influence the moisture-laden current. Between March and the rains an occasional thunder shower may relieve the heat for a few hours, but apart from that it is a time of increasing dry heat, and by May even the

nights are unpleasant. Where there is irrigation there will be a little greenery all the year round.

The hilly quadrilateral to the S. has the same round of seasons in its N. part, but it is on the whole a good deal drier than the Ganges-Indus plain. In the rains, among the stony hills, the water runs away quickly, while in the level plain the rains bring constant humidity, which to many is more unpleasant than the great dry heat of May and June. The farther S. one goes the less pronounced becomes the difference between summer and winter, while the rains of winter, the N.E. monsoon, are a leading feature of the climate of the country below the Eastern Ghats. The winter rains of the Ganges-Indus plain are brought by meteorological disturbances from Iraq and Persia. Their non-arrival is fatal to all hopes of a first-class harvest.

TERRITORIAL DIVISIONS AND POPULATION. The table below shows the former British provinces now wholly in the Union of India or dominion of Pakistan.

The Punjab (99,089 sq. m., pop. 28,418,819, including 16,217,242 Muslims, 7,550,472 Hindus, 3,757,401 Sikhs) and Bengal (77,442 sq. m., pop.

FORMER INDEPENDENT STATES

	Area (sq. m.)	Pop.
Alwar	3,158 ..	823,055
Bahawalpur	17,494 ..	1,341,000
Baroda	8,236 ..	2,855,010
Bastar	13,725 ..	633,888
Bharatpur	1,978 ..	575,625
Bhavnagar	2,961 ..	618,429
Bikaner	23,181 ..	1,292,938
Bhopal	6,924 ..	785,322
Cochin	1,493 ..	1,422,875
Cooch Behar	1,318 ..	639,898
Cutch	8,249 ..	500,800
Garhwal (Tehri)	4,500 ..	537,189
Gwalior	26,008 ..	4,006,159
Hyderabad	82,313 ..	16,338,534
Indore	9,934 ..	1,513,966
Jaipur	15,610 ..	3,040,876
Jodhpur	36,120 ..	2,555,904
Junagadh	4,017 ..	816,344
Kashmir	82,258 ..	4,021,616
Kolhapur	3,229 ..	1,092,046
Kotah	5,714 ..	777,398
Manipur	8,638 ..	512,069
Mysore	29,458 ..	7,329,140
Nawanagar	3,791 ..	504,006
Patiala	5,942 ..	1,936,259
Patna	2,530 ..	632,220
Rewa	13,000 ..	1,820,445
Surguja	6,055 ..	551,307
Travancore	7,662 ..	6,070,018
Tripura	4,116 ..	513,952
Udaipur	13,170 ..	1,926,698

60,306,575, including 33,005,434 Muslims, 25,059,024 Hindus) are divided between the two dominions, W. Punjab with Lahore (pop. 671,659) as its principal town being in Pakistan, E. Punjab (Delhi, pop. 521,849, and Amritsar, pop. 391,010) being in India; while W. Bengal, including Calcutta (pop. 2,108,891), the largest city in the sub-continent, is in India, E. Bengal (Dacca, pop. 213,218), with the Sylhet district of Assam (area 5,288 sq. m., pop. about 2,400,000) is in Pakistan.

The Indian states, about 570, formerly feudatory to or protected by Great Britain, regained their independence with the passing of the British raj in Aug., 1947, but were advised by the British government to accede to one or other of the new dominions of India and Pakistan. The instrument of accession gave the dominion legislature authority to make laws for acceding states in matters relating to defence, external affairs, and communications. Many states were later merged in unions or larger states. The states had a total area of 715,964 sq. m. and a pop. of 93,189,233. They varied in size from petty states, e.g. Lawa in Rajputana, 19 sq. m., to Hyderabad, very nearly as large as Rumania. States with a pop. of 500,000 are listed in the table above.

UNION OF INDIA

	Area (sq. m.)	Pop.
United Provinces	106,247 ..	55,020,617
Bihar	69,745 ..	36,340,151
Bombay	76,443 ..	20,849,840
Central Provinces and Berar	98,575 ..	16,813,584
Orissa	32,198 ..	8,728,544
Madras	126,166 ..	49,341,810
Assam (except Sylhet district)	49,663 ..	7,800,000
Delhi	574 ..	917,939
Coorg	1,593 ..	168,726
Ajmer-Merwara	2,400 ..	583,693

DOMINION OF PAKISTAN

British Baluchistan	9,476 ..	88,000
N.W. Frontier Province	14,263 ..	3,038,067
Sind	48,136 ..	4,535,008

INDUSTRY AND AGRICULTURE. Before the days of steam navigation and of the industrial age in Europe, the manufactures of India were domestic industries, many of which still go on. But from about 1870 India became an industrial country on a considerable scale, though agriculture is still directly the mainstay of two-thirds of the population. The jute plant flourishes in Bengal, and there are many jute mills in and round Calcutta. Cotton grows in many areas, the best kinds being produced in central India and Sind (Pakistan).

There are many cotton spinning and weaving mills in Bombay, Madras, Bengal, and the Uttar union. There are also ginning presses wherever much cotton is grown. Tanneries and leather factories exist at several places, particularly at Madras and Cawnpore. Cawnpore has also cotton and woollen mills, and sugar refineries. Sugar is also refined at other centres, and there are more woollen mills at Dhariwal in the Punjab, and Bombay city. Paper of poor quality has long been made in India, but there are mills turning out good paper in Bengal, Oudh, and Bombay. Silk mostly comes from Bengal and Mysore.

Gold mines exist in Mysore, and there is a little gold-washing in some rivers. There are large coal mines in districts on each side of the border between Bengal and Bihar and Orissa. Assam, the Madhya union, Hyderabad, and central India also have fair-sized coal in-

dustries and there are small ones in Baluchistan, the N.W. Frontier Province, and the W. Punjab. High grade manganese is found in the Madhya union, and this mineral is also found in northern Madras, central India, and Mysore. This industry has grown very rapidly since 1900. Petroleum is found in Assam, the Punjab and Baluchistan. Iron is successfully worked in Bengal, Bihar, and Orissa. A few diamonds are found at Panna in central India. India is the world's largest producer of mica, which comes mostly from Bihar and Orissa. Salt is extracted from the sea by evaporation in Madras and Bombay. There are mines in the salt ranges in the Punjab, and salt lakes in Rajasthan. Some salt is imported from Aden and elsewhere. Saltpetre is produced in the plains of N. India. Indigo used to be extracted in quantity from indigo bearing plants in Madras and in Bihar, and to some extent farther up the Ganges plain, but this industry was ruined by the discovery of synthetic dyes.

Tea is produced in Assam, also in the Darjeeling district of Bengal, and in the hills of Madras, Travancore, and Cochin. Smaller amounts are produced in the hills of Bihar and Orissa, and in the Himalayan districts of the Uttar union and the Punjab. The greater part of the tea exported goes to the United Kingdom. Some coffee plantations in Mysore, Coorg, and the Nilgiris have survived the leaf disease which played havoc with the trees about 1880.

Behind a tariff wall, put up in 1931, India in a few years built up an enormous sugar growing industry and is now among the most important sugar producing countries; the industry is centred chiefly in the Uttar union and Bihar. Oil seeds are grown in nearly all parts of India, and there is a considerable manufacture of oil-cake.

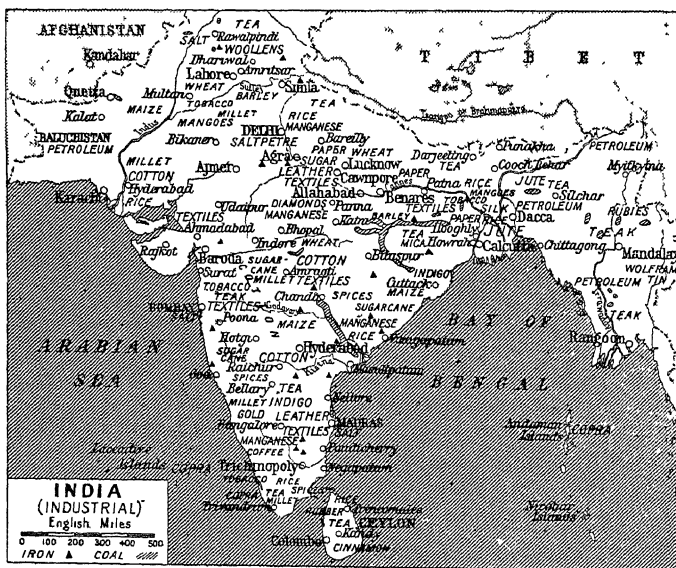
Other important agricultural products are rice, wheat, barley, millets, maize, gram and other pulses, linseed, rapeseed, mustard, and other oil seeds, spices, tobacco, fodder crops, and garden crops. Where conditions favour, fruits of many kinds are produced—notably the mango, perhaps the most characteristic and specially Indian fruit. In favourable years, India exports wheat.

Out of a total forest area of 97,400 sq. m., 29,800 sq. m. are reserved or protected by the provincial forest departments, and are a source of considerable revenue.

The Tata Iron and Steel Company has its chief works at Jamshedpur in the Singhbhum district of Bihar and Orissa. Another important industrial undertaking is the big Bombay hydro-electrical scheme. Water is impounded on the crest of the Western Ghats about 50 m. from Bombay. The energy resulting from the drop of 1,800 ft. to the coastlands is used to supply power to Bombay.

RAILWAYS. Rly. construction in India began shortly before the Mutiny in 1857, and was hurried on as a result of that event, so that by 1869 a total of 6,000 m. was open. By 1947, the total had risen to 40,500 m., about three-quarters owned by the state, which, however, leased about a third of its lines to private companies for working. Nine-tenths of the total was single track; the lines are of four gauges.

The principal routes are as follows. From Chittagong, on the bay of Bengal, the Bengal-Assam rly. goes N. and E. over difficult hill country into Assam, connecting on the W. with Calcutta and N. Bengal. From Calcutta the East Indian rly. goes to Bihar, the Gangetic plain, and Delhi; and the N. Bengal-Nagpur rly. goes W. and S.W. to meet the Great Indian Peninsular and Madras and Southern Mahratta lines. From Madras the Madras and Southern Mahratta line goes N.E. to meet the Bengal-Nagpur, and N.W. to meet the Great Indian Peninsular, S.W. to meet the South Indian rly., W. to meet the Mysore railway. From Bombay the Great Indian Penin-



India. Distribution of products and industries (with those of Burma)

sular rly. runs S.E. to meet the Madras and Southern Mahratta; N.E. to Allahabad, where it joins the E. Indian rly.; E. to Nagpur, where it meets the Bengal-Nagpur in the Madhya union; and N. to Gwalior city, Agra, and Delhi, capital of the Union of India. The Bombay, Baroda, and central India rly. starts from Bombay northwards; and its main broad-gauge line runs through central India and Rajasthan to Muttra in the Uttar union.

The most extensive system of all, the North-Western rly., runs W. from Delhi, spreading over the Punjab, the N.W. Frontier Province, and Sind, to Hyderabad and Karachi, the capital of Pakistan, reaching the Persian border through Baluchistan. Some Indian states had their own lines.

Some 90,000 m. of good metalled roads connect the main centres of pop.; local unmetalled roads serve the countryside. Inland steam navigation is well established on the lower courses of the main rivers. There is also a considerable coasting trade. Calcutta, Bombay, Karachi, and Madras are the principal ports of India. Vizagapatam, Coconada, Negapatam, Tuticorin, Cochin, Calicut, and Porbandar, should also be mentioned.

French and Portuguese Possessions

Remnants of the old French Indian empire remaining are Pondicherry and Karikal on the E. coast of Madras, Yanaon on the Godavari delta, and Mahé on the W. coast of Madras; of the old Portuguese empire, Goa and Damaon on the Bombay coast, and Diu, an island off the Kathiawar pen. French Chandernagore was united with India in 1949.

RELIGION AND LANGUAGE. Hinduism is the principal religion in the Union of India, and has many followers in other parts of the peninsula. It includes actually a large multitude of divergent beliefs. There are Hindus whose real belief is an exalted philosophical theism, and others whose actual beliefs lead to the superstitious worship of various minor deities and godlings. Mahomedanism is the principal religion in Pakistan, and has some, but comparatively few, adherents elsewhere. The 1941 census gave as the distribution of pop. by communities throughout the sub-continent: Hindus, 255,030,506; Muslims, 94,389,428; Christians, 6,316,549; Sikhs, 5,691,447; Jains, 1,449,286; Parsees, 114,890; Buddhists, 232,003; Jews, 22,480; Tribes, 25,441,489; others 409,877.

India has 225 languages, grouped into eight families. The most widely spoken are Western Hindi, 71,547,000; Bengali, 53,469,000; Bihari, 27,927,000; Telugu, 26,374,000; Marathi, 20,890,000; and Tamil, 20,412,000; Punjabi, 15,839,000; and Rajasthani, 13,898,000. Hindustani, a dialect of Hindi, is understood in most parts of India, and English is familiar to the educated.

Small Language Groups

The Mon-Khmer languages are spoken by the inhabitants of the Khasi Hills in Assam. Languages related to this group exist in the Malay peninsula, in the Nicobar Islands, and in Annam and Cambodia. The Munda languages are mostly spoken in the Chota Nagpur uplands, in Orissa proper, and in the Madhya union. The Austro-Asiatic languages are related to the Austronesian, which includes the Indonesian, Melanesian, and Polynesian groups. The Dravidian family of languages is characteristic of the peninsula of southern India, and of part of the Deccan upland. An isolated people, just a small tribe, speaking a Dravidian language, but not physically of a Dravidian type, are the Brahuis in Baluchistan. The Tibeto-Burman languages are spoken in Ladakh and Balistan, in the higher parts of Kashmir, in Sikkim, and in the Assam-Burma hill ranges.

ART AND ARCHITECTURE. Indian art was indigenous, though it was influenced to some degree by Mesopotamian and Persian art. A characteristic Indian art is already manifest in the Indus civilization of the third millennium B.C., after which there is a gap until the Maurya period (322–185 B.C.). The long intermediate development which must be postulated cannot yet be traced. The most notable works of the Mauryas are magnificent pillars with finely sculptured capitals showing Iranian influence, set up by the emperor Asoka to bear his edicts (e.g. at Sarnath) and the great sculptured railings and gateways of the stupas, sacred mounds enshrining the ashes of the Buddha, which continue to develop in the succeeding period (Bharhut, Sanchi, Amaravati).

The next point of interest is the Gandhara school, which flourished in N.W. India and Afghanistan, c. 200 B.C.–A.D. 320, and was influenced by Greek art. The classical age of Indian sculpture, however, is the Gupta period (320–600), when the perfected

types of divinities, Buddhist and Brahmanical, were developed. It was the Gupta art which was carried to the Indian colonies of the far east, Malaya, Cambodia, Java. The climate has played havoc with much of the superb work of the sculptors of this and other ages, but enough has survived to show that they were consummate modellers, keen observers of character, skilled in composition.

The sculptors were averse from portraiture, because individualism was repugnant to the spirit of their faith. Their aim was to produce, if possible, an impersonal type of face, for their main concern was with the spiritual and eternal. It is impossible to appraise Indian skill in painting with any approach to exactitude, as nearly all the great examples of the past have vanished. The painters wrought mostly in fresco, a method still practised, since it is exceptionally adapted to interior decoration in the dry tropical climate, and, with care, is more durable than oil painting. The remains in the cave temples of Ajanta, in Hyderabad, covering the sixth to eighth centuries A.D., are among the finest specimens.

The period following the Gupta supremacy saw great architectural development and produced a northern type of temple, with curvilinear towers (e.g. Khajuraho) and a southern type with stepped towers (e.g. the Shiva temple at Tanjore). Vast quantities of sculpture adorned these, and also the great temples which sprang up in Indonesia of which Boro Budur (Java, 8th cent.) and Angkor Vat (Cambodia, 12th cent., see Angkor Vat. illus.) are the most famous.

Remarkable Rock Temples

In the Deccan, another architectural feature is the rock temple, generally a basilica-like chamber hewn out of the solid rock in some lonely spot where it could serve one of the monastic communities of the Buddhist period, though Jainist and Hindu temples of this type also exist. The most remarkable are those of Ajanta (Buddhist, 2nd cent. B.C. to 7th cent. A.D.), Ellora (Jain, 6th to 8th cent. A.D.), and the island of Elephanta, near Bombay (Hindu, 10th cent.).

The Muslim conquest brought the penal prohibitions of the Koran against images, but even the early conquerors were patrons of the arts and encouraged Hindu craftsmen to build for them mag-

nificent mosques and tombs, to which the newcomers contributed the important ideas of the arch, the dome, and the minaret. Notable achievements are the Kutb Minar (1231) at Delhi, with a great tapering tower, and the tomb of Altamsh (1235). Under the Mogul emperors art became less austere. Akbar's city, Fathpur Sikri, the fort at Agra, and the Taj Mahal (1632) show the variety and power of Mogul architecture, while in painting the famous school of miniaturists flourished.

Alike to western and eastern taste, these Mogul miniatures, deriving remotely from the Persian school, are the most acceptable examples of Indian pictorial art. Painted on very fine Indian or Chinese paper, the colour scheme in the figure subjects is harmonious and perfect, and, small though the pictures are, they possess inexpressible decorative value and charm. Their minuteness of detail and exquisite finish are marvellous, but they are not without defect; for frequently the drawing is at fault and naive, the composition stiff and conventional. But the portrait miniatures, whether of man or bird, are masterly.

Twentieth Century Revival in Art

After Aurungzebe's death (1707) anarchy set in, and by the time that British rule was firmly established native artists had suffered eclipse. With the advent of the 20th century, however, a revival of art on Indian lines and following Indian traditions was seriously attempted under the guidance of native artists, such as Abanindro Nath Tagore, Nanda Lal Bose, and Surendra Nath Ganguly, supported by the enthusiastic advocacy of E. B. Havell, formerly principal of the government school of arts and keeper of the Calcutta art gallery.

Bibliography. *History of Indian and Eastern Architecture*, J. Ferguson, rev. ed. 1910; *Handbook of Indian Art*, E. B. Havell, 1920; *A History of Indian and Indonesian Art*, A. K. Coomaraswamy, 1927; *History of Fine Art in India and Ceylon*, V. A. Smith, rev. ed. 1930.

ARCHAEOLOGY. The archaeological survey of India, inaugurated in 1862, has performed an invaluable service of recording and preserving, aided by the statute of 1904 which secured the conservation of important ancient monuments. India had its Palaeolithic age, attested by roughly chipped stone implements, mostly of quartzite, found in large numbers in S. India. The Neolithic age is represented by more numerous and widespread stations,

extending to Baluchistan, to the Himalayas, and to Indo-China. Finely ground and polished stone implements, resembling those of W. Asia and Europe, are found on these sites, which include Bellary and Tinnevely (Madras) and also Mirzapur (Uttar union). Neolithic man domesticated animals and plants, spun, wove, engaged in trade, and buried the dead. The custom of burial in megalithic tombs was perhaps carried to India at the end of the period, and dolmens abound in the S., although these seem to belong mainly to the iron age, and appear to mark the track of ancient gold, copper, diamond and other gem mining, and pearl fishing. Certain paintings found in caves are probably Neolithic.

Civilization 5,000 Years Ago

No trace of a bronze age has been found in India. Neolithic culture persisted in S. India into the 1st millennium B.C., when it was gradually displaced by an iron age culture coming in from the N. In N. India there is a chalcolithic age, i.e. a period when tools of copper were used side by side with those of stone. To this belongs the remarkable civilization of the Indus valley, discovered in the 1920s, when the cities of Mohenjo-Daro and Harappa were excavated. This civilization was at its height between 3000 and 2500 B.C. and was in commercial and cultural relationship with the contemporary river-valley civilization of Sumera. The characteristic seals, which are found in large numbers, and some of which reached Ur of the Chaldees, bear pictographs, unfortunately not yet deciphered, and representations of deities and their attributes which show affinities with certain of the Hindu gods, though a mother-goddess holds high place in their religion. The people of that era built their houses of kiln-burnt brick and provided them with both bathrooms and drains. They turned fine pottery on the wheel, had wheeled carts, and cultivated the fertile land around them. Their very high artistic gifts are shown by their jewelry and sealstones, and by a few remarkable stone statues.

HISTORY. The ethnology of the sub-continent of India is confused, and the formerly accepted division of its early inhabitants into Dravidians and Aryans is an over-simplification. Some of the earliest tribes seem to have had Negrito affinities; others, in the N.E., were related to the Mongols; another strain, perhaps

that of Mohenjo-Daro, belonged to the Mediterranean type of man. The chief prehistoric language, however, was Dravidian, and its speakers were pushed gradually southwards by Aryan tribes which arrived in India from the N.W. during the second millennium B.C., bringing their gods Indra, Mitra, Varuna, etc.

Probably one great wave conquered and occupied the Punjab some time before 1000 B.C., to be followed a short time later by another wave which flowed into the Upper Ganges basin. In all this region the Aryan stock seems to have predominated, with an increasing proportion of the original Dravidian or Mongolian farther down the Ganges. From this region, i.e. Hindustan proper, the Hindu or Aryan conquered N. India, but only to a limited extent penetrated into or established himself on the plateau which forms the S. half of the sub-continent. It seems tolerably certain, however, that he had made his way to the extreme S. before 600 B.C., taking with him his religion, but failing to impose his language. The Aryans were themselves very largely assimilated by the pre-existing population, though the institution of caste to some extent diminished this. Among these racial blends, the Hindu religion predominated.

A collection of hymns, the Rig-Veda, compiled about 1200 B.C. preserves a confused account of early Aryan society. The tribes of the Veda share the common Indo-European way of life, and are very like Homer's Achaeans, with a patriarchal system, elected warrior chiefs, and with women holding a high position.

The Code of Manu

The later epics, Mahabharata and Ramayana, recording the story of the conquest, and the code of Manu, describing the social, religious, and political systems, belong to the period when Brahmanism had become fully established. They describe the foundations of the caste system upon which the whole Hindu organization still rests. The whole people is divided into the three castes of the "twice-born," the superior, conquering race; the remainder, the baser conquered peoples, forming the fourth caste. The castes of the twice-born are the Brahmans, the Kshattriyas or Rajputs, and the Vaisyas, the priestly, military, and agricultural castes, rigidly separated from each other by the prohibition of inter-

marriage, but even more rigidly from the fourth caste, the Sudras.

During the conquest the system cannot have had full play, since the races became much mixed. There was crossing of castes and an immense multiplication of subdivisions, born of local, tribal, or industrial customs, the basis of all subdivision being the prohibition or limitation of intermarriage. But the Brahmans, to establish their own ascendancy as being of superior sanctity, developed the religious sanction of the whole system till the penalties for breach of caste became to the Hindu as terrible as excommunication to the Roman Catholic.

Buddhism and Brahmanism

About 530 B.C. Prince Gautama, best known as Buddha, surrendered his royal functions in order to spread abroad the religious and moral conceptions known as Buddhism (*q.v.*). The new doctrines cut at the roots of Brahmanic sacerdotalism, and many centuries passed before Brahmanism recovered its old ascendancy. During this period the veil between E. and W. was lifted for a moment by the invasion of Alexander the Great in 326 B.C.

Some years later the ambassadors of Seleucus visited the court of a mighty king whom they called Sandracottus. This prince is identified with Chandragupta, who built up the kingdom of Magadha, roughly corresponding with the prov. of Oudh on the Ganges. Asoka, grandson of Chandragupta, is famous among the wisest and most virtuous of kings; during his reign he adopted Buddhism. Brahmanism in those times had fallen to a secondary position.

Neither then nor at any other time was there anything like an Indian empire. A king may have founded a great dominion or a powerful dynasty, but the mightiest of monarchs was only a king who had made other kings tributary to him, not the organizer of a homogeneous and consolidated state. It was probably during the 1,000 years after Buddha that the most extensive fusion of races took place.

The Brahman system set Church and State side by side, with the Church as the higher authority. The kings and captains were Rajputs; the Brahmans were the priests and ministers who actually held authority over them. But during the Buddhist period little attention was paid to the Brahman canons. Probably the code of Manu marks the time when Brahmanism had recovered its ascendancy, accompanied by an increased formalism, and by its appropri-

tion for popular purposes of a vast quantity of the indigenous religions, demonologies, or superstitions.

In the 7th century A.D. the new militant religion of Mahomet conquered all W. Asia except where the Byzantines still maintained a precarious hold. It was not, however, till the close of the 10th century that the Mahomedan flood burst the dams of the Indian mountain barrier. With Mahmud of Ghazni, A.D. 1001, began the era of Moslem conquest. Year after year Mahmud's conquering armies poured over the Punjab and swept E. to the Jumna or S. to Gujerat; but still for 150 years the Mahomedan invaders, themselves of Turkish or Afghan race, were only invaders, militant missionaries of Islam in search of booty and tribute.

Between 1176-1206 Mohammed of Ghor (Shahab-ud-Din) set about a real conquest of the Punjab and the Ganges basin, and from that time Mussulman dynasties dominated N. India, dynasties whose power rested upon their alien armies of Turks and Afghans, who were in effect a ruling military race holding sway over the conquered Hindus but not amalgamating with them, since Hindu and Mahomedan were each in the other's eyes infidels, hateful as outcastes or as idolaters. Mahomedan sway penetrated into the Deccan under Ala-ud-Din or Mohammed, Shah of Delhi, towards the close of the 13th century.

A Century of Confusion

The 14th century was the era of the Tughlak dynasty, whose empire fell to pieces after the devastating inroad of Tamerlane in 1398. During the 15th century most of India became a congeries of warring states expanding and contracting, appearing and disappearing under short-lived Mahomedan dynasties, while here and there some Hindu power held its own.

Every conquering horde had hitherto entered India from the same quarter, Central Asia, and by the same gateways, the passes of the north-western mountains. At the close of the 15th century, a menace arose from an entirely new quarter. The ocean, hitherto the most insuperable of barriers, was about to become the highway of the European peoples. In 1486 the Portuguese first doubled the Cape of Good Hope; in 1498 Vasco da Gama landed on the Malabar coast at Calicut. The Portuguese were the forerunners of another people which in time was destined to bring all India under its sway.

The time of the Europeans was not yet. A new dominion—this, too, coming from Central Asia—was about to be established. The empire of the Great Moguls was founded in c. 1525 by the conquests of Babar, on his father's side a Turk descended from Tamerlane, on his mother's a Mughal or Mongol descended from Jenghiz Khan.

The Mogul Empire

Babar, succeeding as a child to a small principality in Samarkand, was ejected from his inheritance, and spent an adventurous youth in seeking a throne, which at last he secured in Afghanistan. When the governor of the Punjab revolted against the sovereignty of the Lodi dynasty then reigning at Delhi, he invited the aid of the king of Kabul, with the result that Babar, having come to help the governor, returned to help himself. With no more than 12,000 men, he swooped through the Punjab, shattered the huge armies of the Lodi emperor at Panipat in 1526, and during the next four years broke up every force of every opponent between Afghanistan and Bengal.

After Babar's death in 1530, the Mahomedan or Rajput princes were ready enough to throw off the new domination, and Babar's young son Humayun was driven back to Afghanistan. For a few years a successful leader, Sher Shah, assumed and retained dominion over the Ganges provinces and set about organizing the government with a statesmanship almost without precedent. The expelled Humayun, however, ventured upon a new invasion after Sher Shah's death, and though he died in 1556, his minister Bairam and his young son Akbar triumphed over their opponents at a second battle of Panipat, and definitely established the Mogul empire over Hindustan.

The Mahomedan Supremacy

Mahomedan conquerors had always offered the vanquished the choice of conversion, tribute, or death. In India they were the masters and the Hindus were the subjects, though the adoption of Islam admitted the conquered to the privileges of the conquerors. The Hindus were contemptuously permitted to retain their own customs and their own religion. Taxes were imposed on them, from which the Mahomedans were free; at the best they stood to their Mahomedan lords in the same sort of relation as that of the English to the Normans after the Norman Conquest. Akbar, however, was a monarch of a singular enlightenment. An avowed Mahomedan,

he interpreted the religion of the prophet in very unorthodox fashion, and encouraged the fullest and freest discussion of all things in heaven and earth. He was resolved to weld his empire into a harmonious whole, not by imposing uniformity nor by crushing one section under the heel of another, but by applying the same principles to all men, whatever their race or religion.

The Rule of Akbar

Rajput princes were admitted to military commands and Brahmans occupied the highest ministerial posts. The differentiating taxes were abolished, the whole land system, the main source of the imperial revenue, was reorganized by the Brahman Todar Mal, on lines which had actually been inaugurated by Akbar's predecessor Sher Shah. Akbar's favourite wife, the mother of his successor, was a Rajput princess. Akbar extended the borders of his empire, but he had little lust for military glory, and his victories at home and abroad provided him with opportunities for a generous magnanimity which never failed.

Akbar died in 1605. The tradition of toleration, of equality between Mahomedan and Hindu, was on the whole maintained through the reigns of his son and grandson, Jehan Gir (1605-27) and Shah Jehan (1627-58). In the reign of the latter, one of the three greater kingdoms of the Deccan, Ahmednagar, was broken up and divided between the empire of the Mogul and the kingdom of Bijapur, while Golconda was forced to pay a heavy tribute; but the Deccan was not yet included within the Mogul bounds. This emperor is perhaps best known in the west as the builder of the Taj Mahal and the Pearl Mosque.

Aurangzebe and Hinduism

In 1658 Shah Jehan was deposed by his son Aurungzebe, who prepared the disruption of the empire. Ambitious, self-confident, suspicious, treacherous, and fanatical, Aurungzebe earned the fervent praises of the Muslim historians as the champion of Mahomedan orthodoxy and domination. With varying success he strove to bring all India under his dominion. He revived the old repressive laws against the Hindus and resuscitated the dying hostility between the followers of the two religions, and the animosity of the Hindu to Mahomedan domination.

The borders of an unwieldy empire were extended by uncompleted conquests; and it was divided into provinces so large that their several rulers could each hope

to make a bid for independence. When Aurungzebe died in 1707 the Mogul empire had reached its maximum expansion, and his nominal sovereignty extended from Kabul to Cape Comorin.

Two hostile developments demand special attention. About the time of Babar there arose in the Punjab a sect, Hindu in its origin, but departing fundamentally from many Hindu principles, including that of caste, who formed the Sikh brotherhood. Primarily a religious community, the development of their organization began during the 17th century to assume a political character.

Early in the reign of Aurungzebe that monarch caused or sanctioned the assassination of their *guru* or spiritual head. His son and successor, Govind Singh, devoted his life to organizing the Sikhs as a military brotherhood bound together by religious enthusiasm, and possessed with a rooted animosity towards Mahomedans in general and the Mogul dynasty in particular. Occupying the Punjab, the Sikhs became a permanent thorn in the side of the Moguls, a ceaseless cause of unrest and of weakness to the empire at the most vulnerable point of India.

The Maratha Power

The second development was the organization by Sivaji of the Hindu Marathas, then occupying the hill districts on the W. and N.W. of the Deccan. These tribes are held to descend from a stock formed by a cross between the Dravidian peoples and so-called Scythian tribes, presumably of Tartar origin, which poured into India and were ultimately absorbed without leaving traces of a separate existence. Like other Deccan peoples, the Marathas had adopted the Hindu religion, but had never become organized as a political combination or anything like a state. Sivaji's achievement was that between 1650-80 he developed among the Marathas a military and political organization which enabled him first to challenge the kingdom of Bijapur, and then to alternate between formal submission to and effective defiance of Aurungzebe. The result was that the Maratha organization, loose though it was, raised that people in 1700-50 to a position which threatened to render them the dominant power in India.

Aurangzebe was the last Mogul who held any real grip on the empire. In 1739 the death-blow was administered by the Persian monarch, Nadir Shah, who defeated the Mogul armies, sacked Delhi, and virtually emptied Hin-

dustan of treasure. From that time the Mogul Mohammed Shah and his successors were merely puppets in the hands of the strongest native ruler of the moment, usually a Maratha prince. Between the death of Aurungzebe and the invasion of Nadir Shah, the Maratha power developed into a confederacy with the descendant of Sivaji as a puppet sovereign, while the effective headship was gradually appropriated by the hereditary chief ministers, the Brahman Peshwas.

By 1740 the Maratha power dominated the western coastal districts of the Deccan, extended all over Central India between the Narbada and the Jumna, and was spreading eastwards, the rest of the Deccan being under the rule of the great viceroy of the empire, the Nizam of Hyderabad. The Ganges provinces were divided between the nawabs or lieutenant-governors of Oudh and Bengal; N.W. of the Marathas, Rajputana was virtually a group of independent Rajput principalities; while the Punjab was a cockpit in which imperial officers, Sikhs, hill tribesmen, and Afghans from beyond the hills fought miscellaneous.

Hitherto Europeans had not intervened. Throughout the 16th century the Portuguese had the field to themselves; and Portugal had more than enough to do in establishing a maritime ascendancy over the Indian Ocean without attempting territorial conquests. The maritime development of the western nations led to the birth of the British and Dutch East India Companies, chartered for purposes of trade in the early 17th century.

Growth of European Interests

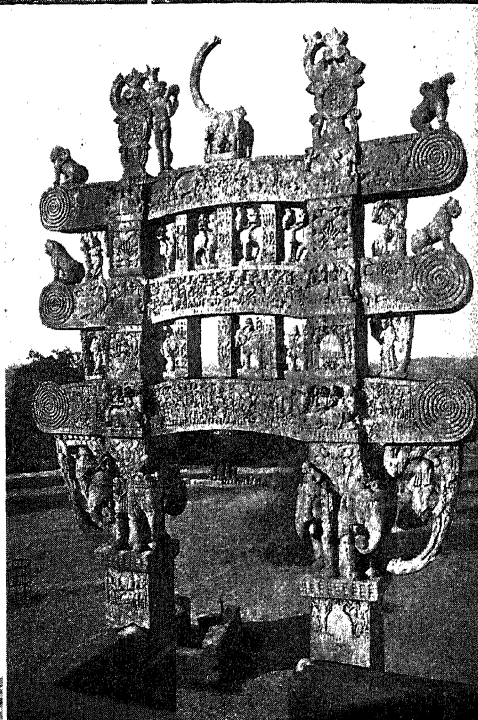
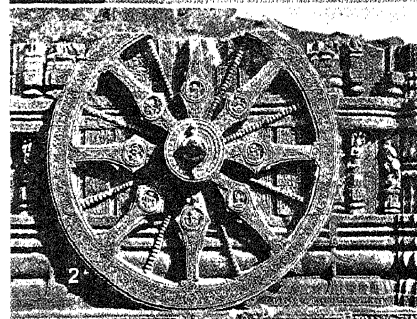
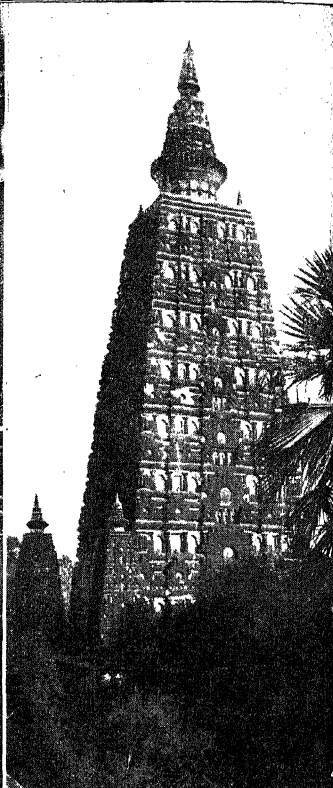
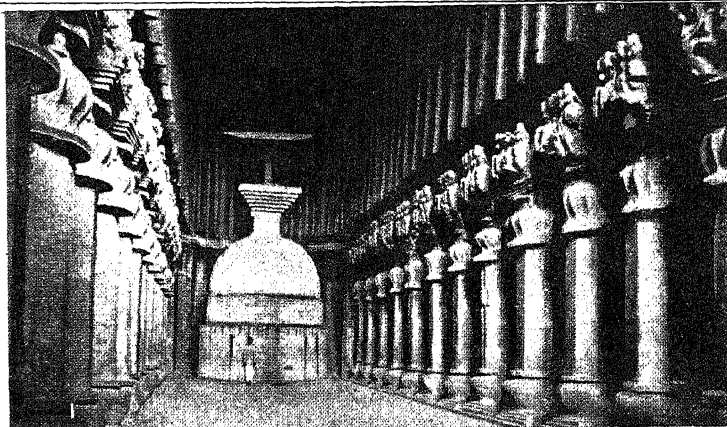
The Dutch gave their attention mainly to Ceylon and the Spice Islands; the English traders leased a factory or trading station at Surat on the W. coast in 1612, another at Madras in 1639. The occupation of a third factory at Hooghli, in the Ganges delta, was confirmed by Shah Jehan in 1640, and this near the end of the century was transferred to Calcutta, the settlement taking the name of Fort William, in honour of William III. In 1661 Bombay was conveyed by the Portuguese to Charles II. and transferred by him to the East India Company.

A few years later a French East India Company entered the field, and, like the English, leased factories or trading stations at Pondicherry, S. of Madras, and at Chandernagore in Bengal, where the Dutch also had a station at Chinsura. The companies were permitted to fortify their stations



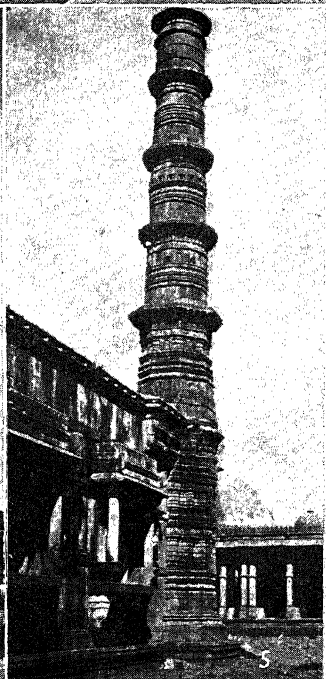
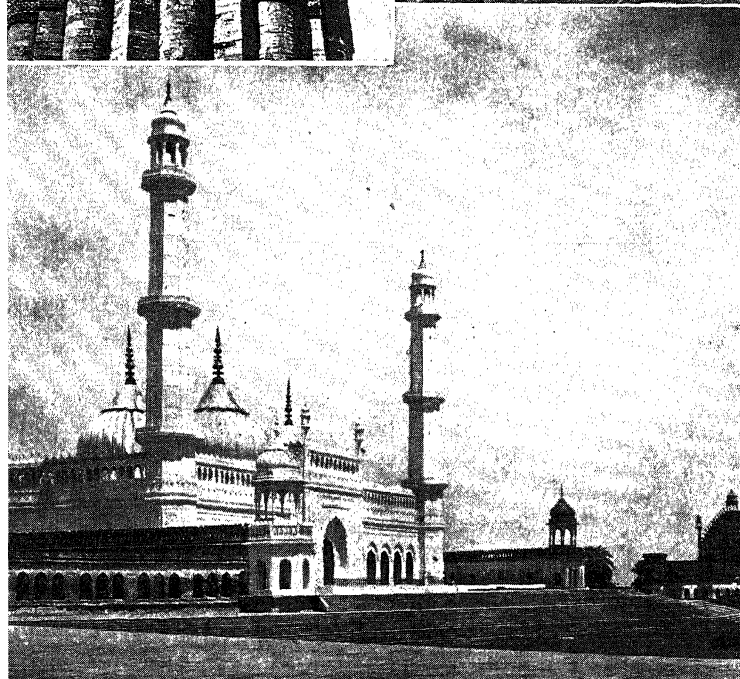
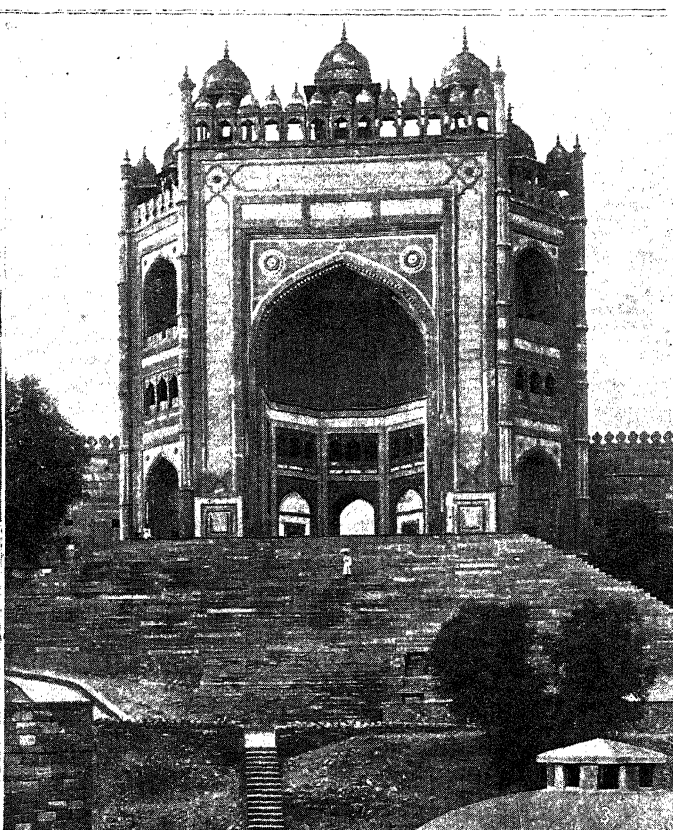
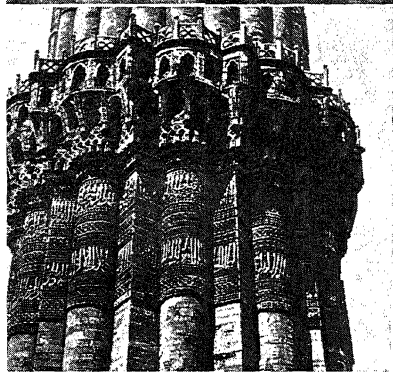
1. Slate relief at Bihar, 12th cent., representing Ganesha holding Parvati. 2. Painting of a hawk, of the Mogul school, 17th cent. 3. Pierced sandstone window of the mosque of Sidi Sayyid, Ahmadabad, early 16th cent. 4. Painted illustration, 16th cent., to the Akbar-Namah, official record of Akbar's life, depicting the emperor's entry into Surat. 5. Muslin dress-piece, decorated with drawn-thread work and embroidery in white cotton thread, Madras, 19th cent. 6. Pen-and-ink drawing of a warrior, early 15th cent. 7. Marble relief of a leogryph, Rajputana, 10th cent.

INDIAN ART: PAINTINGS, CARVINGS, AND EMBROIDERY OF ANCIENT AND MODERN SCHOOLS



1. Buddhist temple of Karli, in the Western Ghats, entirely hewn from solid rock 2,000 years ago, and still covered with its original teak roof. 2. Carved wheel, Black Pagoda, Kanarak, Orissa (Hindu, 13th cent.). 3. 13th cent. carving of the Buddha's Ladder, Barhut, Nagod.

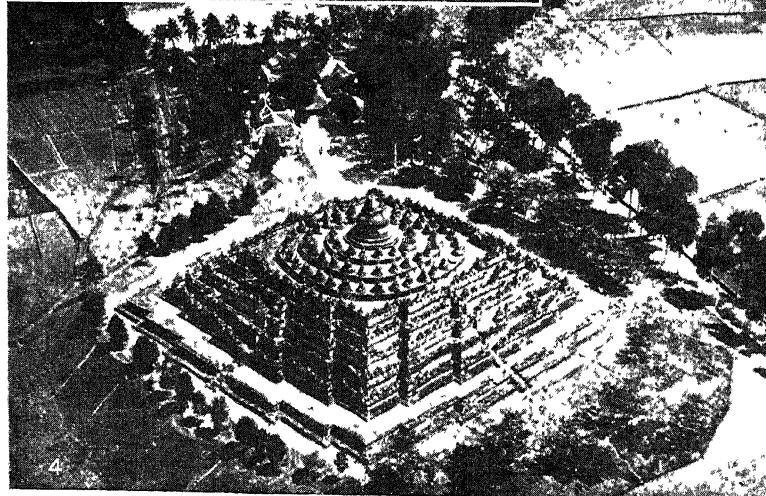
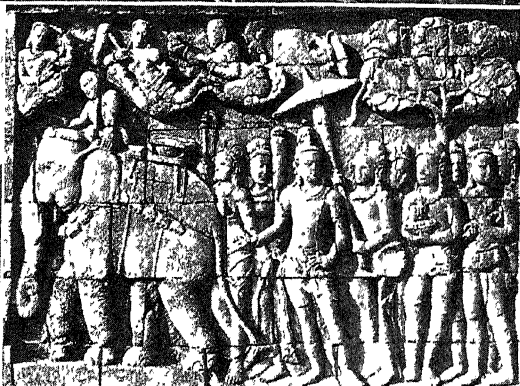
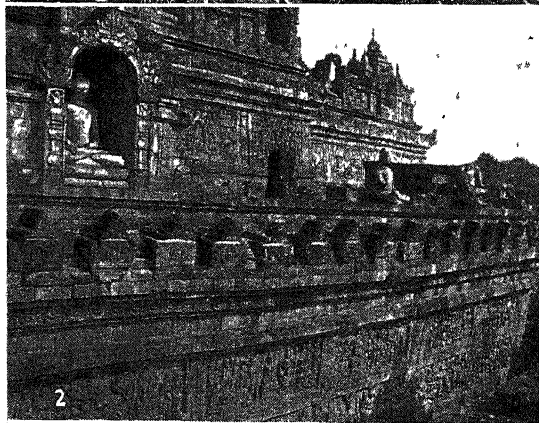
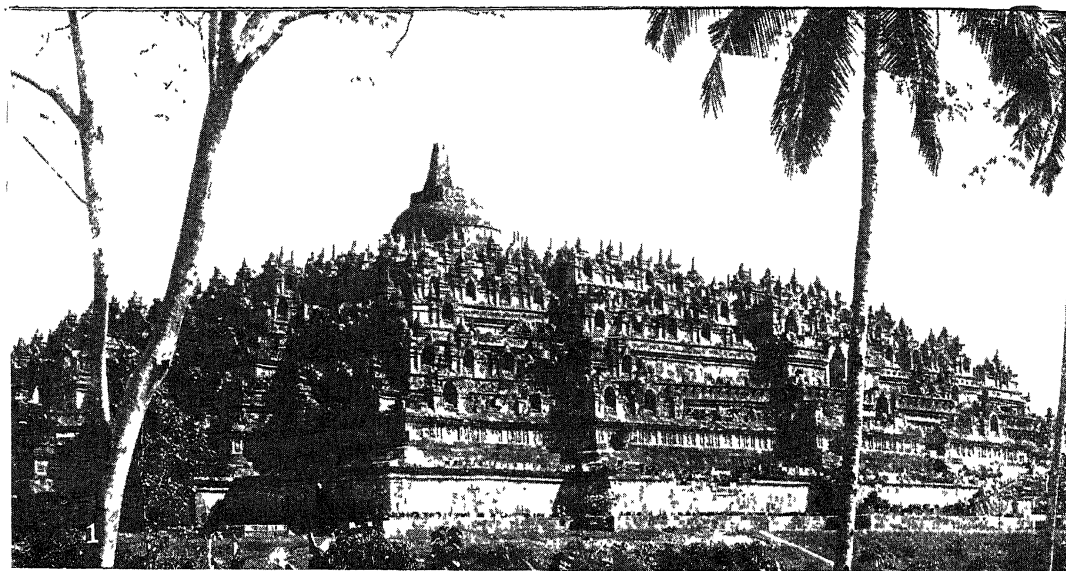
4. The Buddh-Gaya, beautiful brick temple of unknown date, marking the birthplace of Buddhism. 5. Kandarya Mahadeva, 10th cent. Vishnu temple at Khajuraho, Bundelkhand. 6. One of the four gateways of the 2,000-year-old shrine of Sanchi, Bhopal, carved to depict the Buddha's life.



1. Palace built on the rock at Gwalior, 15th cent., showing Hindu architecture in a transitional phase, modified by Muslim influence. 2. Decorative use of arabesques and Arabic script in carvings of the Kutb Minar, near Delhi, 13th cent. 3. Akbar's "gate of victory," southern gateway

to the great mosque at Fatepur Sikri, which represents the culminating grandeur of Mogul architecture. 4. The Imambara, Lucknow, built by Asaf-ud-dowla, 1784, place of Muslim pilgrimage. 5. Minar, or tower, of the early 16th cent, mosque of Sidi Sayyid, at Ahmadabad, Bombay prov.

INDIAN ART: THE INFLUENCE OF THE MUSLIM FAITH ON THE ARCHITECTURE OF INDIA



Just as some of the finest Roman art is to be found beyond the borders of Italy, so one of the outstanding memorials of ancient Indian culture is in the heart of Java, 2,000 m from the seats of northern Indian civilization. Borobudur is a low hill encased within a pyramidal shell of black stone, intricately carved and terraced, with two

miles of sculptured reliefs. The date is 8th-9th cent. 1. General view. 2. The carved walls: showing one of more than 4,000 niched figures of the Buddha. 3. Bas-relief: Cortege of the Sacred Elephant. 4. General air view. 5. Statue of the Buddha, removed from its perforated cupola shrine: there were originally 72 such cupolas.

INDIAN ART · THE MAGNIFICENT BORO BUDUR BUDDHIST SHRINE IN THE HEART OF JAVA

Photos 1, 2, 3 and 5, G. P. Lewis, 4, E. N. A.

and to maintain a handful of soldiers for what were practically police purposes.

The true begetter of the British empire in India was the Frenchman, François Dupleix. Realizing to the full the disintegration of the Mogul empire and the instability of the Mahomedan dynasties, Dupleix conceived the idea of establishing supreme French influence at the courts of native potentates which would, in fact, make the French the masters of India. But the condition precedent was the suppression of the British. Unfortunately for Dupleix, he had not the necessary sea power. A simple duel between the French and the British actually in India might, and probably would, have resulted in a French victory.

Sea power completely turned the scale because it enabled the British to recover from the effects of defeat while making it impossible for the French to do likewise. Therefore, instead of the French suppressing the British the British suppressed the French.

French and British Rivalry

The headquarters of French and British were at Madras and Pondicherry in the Carnatic, a great province whose nawab was a lieutenant of the Nizam of the Deccan at Hyderabad. The declaration of war between France and Great Britain in 1744 gave Dupleix his opportunity. He had already secured the favour of the Nawab of the Carnatic; in 1746 he attacked the British and captured Madras. His progress was temporarily checked by the peace of 1748, which compelled him to restore Madras and stopped formal hostilities. But a new way was opened by disputed successions both to the Nizamship and to the Nawabship of the Carnatic.

The French and their trained natives (sepoys) had won a high reputation; Dupleix came forward as the champion of two of the claimants. The British supported the other pair. The French and their candidates seemed on the point of triumph when the tables were turned by the brilliant achievements of Robert Clive. Peace in 1754 left the battle drawn, with the French candidate on the Nizam's throne and the British candidate on the Nawab's.

The outbreak of the Seven Years' War in 1757 renewed the combat, and this time the victory of the British was complete. After 1763 the Nawab of the Carnatic was their puppet, and S. India was divided between four powers, the British, the Nizam, the military state of Mysore just erected by the

Mahomedan adventurer Haidar Ali, and the Marathas. The rapidly expanding power of the last was utterly crushed in 1760, when a huge Maratha army was shattered at a third battle of Panipat by the Afghan monarch Ahmed Shah. In the meanwhile the British had in effect acquired a new dominion in Bengal as well as in the S. An outrage committed upon the British residents at Calcutta by Suraj-ud-Daulah, the Nawab of Bengal, caused Clive to be sent thither with a punitive expedition.

The Battle of Plassey

Clive's sensational victory at Plassey on June 23, 1757, made him the responsible master of Bengal, with complete control over the new Nawab who was set up in the place of Suraj-ud-Daulah. The position was regularised in 1765 when the Mogul, still the nominal sovereign of India, officially recognized the British as the administrators of the province, while the Nawab of the neighbouring province of Oudh became virtually their *protégé* and dependent.

British ascendancy is dated from the battle of Plassey, but the whole area under definite British control, including Oudh and the Carnatic, down to 1790, comprised only perhaps one-eighth of India. The authority of the British was vested in a trading company without experience in political administration. The home government awoke to some sense of its responsibilities and devised an experimental system by Lord North's Regulating Act in 1773.

Under this system it became the task of Warren Hastings, as governor-general, not to extend dominion, but to maintain the existing position. In the face of enormous difficulties Hastings succeeded in the herculean task, and left India in 1785, having laid the foundations of the administrative system in Bengal upon which the structure of the British government in India was afterwards built up. But his rule had shown the necessity, first, for greatly increasing the freedom of action of the governor-general, and, secondly, for the assumption of ultimate responsibility by the imperial government at home.

The result was the characteristically British compromise involved in Pitt's India Act of 1784, logically indefensible but practically effective, which with little modification remained in force till 1858. The governor-general, appointed by the home government, had general instructions, but authority to act upon his own

judgement. Nearly every governor-general had the courage to take the risk of departing from the formal instructions; only two went to India with the intention of following a policy of expansion, but many others found expansion forced upon them.

There were two aggressive native powers, Tippu, Sultan of Mysore in the S., and the Marathas in Central India. And behind them loomed the fear of the recrudescence of the power of France in alliance with the enemies of the British. The Sultan Tippu forced war upon Lord Cornwallis, with the result that part of his territories was reluctantly annexed in 1792. The struggle with Tippu was fought out by Lord Wellesley in 1799; more territory was annexed and the old Hindu dynasty was reinstated in the original domain of Mysore, under British protection.

Wellesley developed the system of "subsidiary alliances." He perceived the necessity for India that there should be not a balance of powers each awaiting an opportunity for aggression, but a paramount power able to prevent aggression and enforce order—which power must necessarily be the British. His method, therefore, was to press upon the native princes the substitution of a protecting force under British control for huge, ill-regulated native levies, the funds for maintaining these "contingents" to be provided from the revenues of districts handed over to British administration. Incidentally, the Mogul was taken under British protection, the British government assuming his sovereign authority.

British Expansion

Wellesley's war with Mysore was followed by a war with the Marathas, but the decisive struggle with that confederacy was deferred till the rule of Lord Moira (1813–22), which transferred the Peshwa's dominions to direct British control and placed the rest of the Maratha princes in the same position as the Nizam and the Nawab of Oudh—a position of autonomy, under British suzerainty which controlled foreign relations and to some extent domestic administration. The N.W. was still untouched. But under Moira there was a short and sharp conflict with the Gurkhas of Nepal in the mountains on the N. of Bengal and Oudh, which resulted in a large cession of territory and the permanent establishment of friendly relations with the Gurkha kingdom. A deliberate challenge from Burma in 1823 led to the first annexations of territory in Farther India in 1826.

Expansion ceased for twenty years. Friendly relations were established with Ranjit Singh, the great Maharajah who in the years 1808-20 built up the powerful Sikh state of the Punjab, but carefully avoided collision with the British. Fear of French aggression was replaced by fear of a Russian advance through central Asia. Suspicion that Dost Mohammed, the Ameer of Afghanistan, was intriguing with Russia led Lord Auckland's government to depose him in 1839 and to restore the monarch whom he had ejected.

The reinstated Shah Shuja was supported by a British force at Kabul. In 1842 the Afghans rose and cut up the British while they were retiring under an ignominious capitulation. In a hard campaign the Afghans were defeated, but perceiving their error the British now reinstated Dost Mohammed, who proved himself a thoroughly loyal ally. The annexation of Sind in 1843 provided the one example of unqualified aggression on the part of the British govt. in India.

The death of Ranjit Singh in 1839 left the Sikh army full of confidence, but without any controlling head. At the end of 1845 it crossed the Sutlej and invaded British territory. A sanguinary campaign followed in which the Sikhs were defeated: but a second war broke out in 1848. After very hard fought battles Lord Dalhousie annexed the Punjab, 1849.

A fresh challenge from Burma forced upon Dalhousie the second Burmese war of 1852, and the annexation of Lower Burma. Dalhousie, convinced that every extension of British rule in India was beneficial to India, applied in several instances the legal doctrine that on the failure of legitimate heirs, principalities lapsed to the paramount power. The legality of the action was never actually in question, but it had been customary for the paramount power to permit a native prince who had no heir of his body to adopt an heir who was recognized as his successor. By refusing to recognize such adoptions, Dalhousie brought Nagpur, Satara, Jhansi, and some other principalities under direct British government. The last annexation, that of the kingdom of Oudh, 1856, was justified by the royal family's persistent misrule.

When Dalhousie retired in 1856, something like two-thirds of the area of India had fallen under British sway. The conquest had been achieved by troops of which only a small proportion were European.

In the army of the company, theoretically the lord paramount of India, the Queen's regiments and the company's own regiments were in 1856 outnumbered by native regiments with European officers in the proportion of five to one. During the hundred years of their expanding dominion the British had gradually established peace from end to end of the Indian peninsula.

Wherever British administration was established, order followed and justice was administered without fear or favour. The burden of taxation was greatly lessened, and religion made no difference to a man's position. But all higher administrative posts remained in the hands of aliens.

A lack of sympathetic intelligence often caused British methods to run violently counter to Hindu sentiments of immemorial sacredness. The Mahomedans, dominant before the British ascendancy, resented their changed status; Marathas, who had seen the mastery of India almost within their grasp, were equally resentful.

In the whole Ganges basin above Bengal there were only a few companies of white troops, but hosts of native regiments. In the Punjab the Sikhs had been at death grips with the British only seven years before Canning succeeded Dalhousie in 1856. Even the definite reforms introduced by a series of administrators and governors-general, notably by Bentinck (1823-1835) and Dalhousie (1848-1856), had their dangerous side. The suppression of the organized murder society known as the

Thugs, and of suttee and infanticide, had overridden the religious sanctions of those practices.

The reorganization of land tenure, especially in the North West Provinces surrounding Oudh, had benefited the tillers of the soil at the expense of the landholders, while under-estimating the clan sentiment which was in some degree outraged thereby. The beginning of railroad making and the inauguration of the electric telegraph were alarming; and Bentinck's development of an educational system upon Western lines was a doubtful experiment. On the surface all was well, but under it doubts and questionings, fears and hopes, were seething. In particular, a fanatical group of Mahomedans were dreaming of a Mogul restoration, while Nana Sahib, adopted son of the last Maratha Peshwa, nursed a bitter grudge against the British govt.

This state of affairs culminated in the Indian Mutiny (*q.v.*), a stupendous event which brought home to the British people the anomalous character of their rule in India and the necessity of assuming national responsibility for her welfare.

Bibliography. History of Aryan Rule in India to the death of Akbar, E. B. Havell, 1918; Oxford History of India from Earliest Times to 1911, ed. V. A. Smith, 1919; Cambridge History of India, 6 vols., 1922-47; Peep into the Early History of India, Sir R. G. Bhandarkar, 1930; India, a Short Cultural History, C. G. Seligman, 1943; Advanced History of India, R. C. Majumdar, H. C. Raychaudhari, and K. Das, 1946.

INDIA UNDER BRITISH STATE RULE

Sir Alfred Watson, Ed., *The Statesman*, Calcutta, 1925-33

The story of India from the end of the East India Company's rule until the creation of the two dominions of India and Pakistan in 1947. See also Burma; Congress; Muslim League; and under the names of the Indian political leaders (Gandhi; Jinnah; Nehru) and the Viceroy

The East India Company was wound up and the control of the Indian government formally transferred to the crown. In the proclamation of Nov. 1, 1858, by which the new regime was inaugurated, Queen Victoria renounced all "further extension of our present territorial possessions" and undertook to "respect the rights, dignity, and honour of the native princes as our own." The promise of amnesty contained in the message was so interpreted by Lord Canning as to win for him the nickname of "Clemency" Canning—a title given in derision, but becoming one of honour.

A period of active development began. In 1860 the penal code, originally drawn up by Lord Macaulay in 1837, was adopted, and in 1861 the Indian Councils Act, giving seats to Indians upon the governor-general's executive council, marked the first step in the closer association of Indians with the machinery of government. The opening out of the resources of the country was fostered by the extension of rlys. and roads, and by further irrigation works.

Lord Elgin who succeeded to the viceroyalty in 1862, died the following year, and Sir John Lawrence entered on five years of

office, the outstanding events of which were the small Bhutan war and the disastrous famine in Orissa in 1866. The latter led to such reforms in famine administration as enabled a like calamity in Bengal eight years later to be successfully averted. The periods of office of Lord Mayo (1869-1872), who was murdered by a convict while on a visit to the Andaman Is., and of Lord Northbrook (1872-6) were marked rather by the gradual extension of social reform and benevolent government activity than by any outstanding event, although in 1875 the then gaekwar of Baroda was dethroned for misrule and replaced by a young prince who, in his later years, made of Baroda one of the most advanced of the Indian states.

The Queen Empress

The visit of the prince of Wales (afterwards Edward VII) in 1875 was the occasion of remarkable demonstrations of loyalty to the crown. Shortly after the accession of Lord Lytton to the viceroyalty in 1876, Queen Victoria was proclaimed empress of India, a title devised by Benjamin Disraeli which was retained by her successors until it was surrendered in 1947 with the end of British rule.

Of Lord Lytton's administration the outstanding event was the second Afghan war. Frontier policy in India, affecting relations with Afghanistan and with the tribal areas that lay between Afghanistan and the undefined borders of India, was long dominated by fear of Russian aggression. It passed through several phases, from the "masterly inactivity" favoured by Lawrence to the "forward policy" adopted by Lytton. In later years it aimed at maintaining friendly relations with Afghanistan, while bringing the tribal areas under control by the extension into them of military roads. Civil war in Afghanistan, whence the Emir Shere Ali had fled, and his place had been usurped by Yakub Khan, led to the demand that a British resident should be stationed at the Afghan capital. Sir Louis Cavagnari, who was sent in that capacity, was murdered, 1880, and a small force of British troops was overwhelmed at the battle of Maiwand.

A perilous situation was retrieved by Roberts's march to Kandahar, by the complete defeat of the Afghan forces, and by the installation of Abdur Rahman Khan as Emir. The new ruler undertook to have no independent relations with foreign powers and

to accept British assistance in the event of Russian attack. British troops were withdrawn from his country. Liberals were now in power in England, and Lord Ripon had assumed the viceroyalty (1880) with the full intention of winding up the Afghan commitment. Yet in 1884 a frontier clash between Russian and Afghan forces at Pendjeh threatened war between Russia and Great Britain; but the incident was smoothed over. Frontiers were finally delimited in 1889.

Under Lord Dufferin's administration (1884-88) Upper Burma and the Shan States were added to the dominions of the crown. The excesses of King Theebaw, his intriguing with the French and his hostile attitude to the British provoked an almost bloodless war as a result of which Theebaw was deposed (1887). The whole of Burma was subsequently ruled as a province of India, under a lieutenant-governor, until in 1937, by the Government of India Act the country was separated and given its own constitution. By agreement, part of Baluchistan in 1888, came under the government of India, the last of many additions to its territory.

The Dawn of Nationalism

In the light of later events the viceroyalty of Lord Ripon (1880-1884) can be regarded as a turning point in Indian history. By his reforms in local government, intended, as he said, as "a measure of political and popular education" and involving the elective principle, he gave a stimulus to dawning Indian nationalism. By what became known as the Ilbert Bill it was sought to give to courts presided over by Indian judges the right to try Europeans. The bill was modified in face of a violent agitation on the part of the European community. The lesson that the government might bend before popular outcry was not lost upon the growing number of educated Indians with access to English political literature.

In 1885 the first session of the Indian national congress was held in Bombay. During the earlier years of its existence the congress, promoted by a retired civil servant, A. O. Hume, and composed of Hindus and Muslims, with a sprinkling of Europeans of advanced thought, contented itself with demands for the application of the elective principle to the organs of Indian government. Its earlier proceedings showed no hostility to Britain. By the Councils Act of 1892, which provided

for further enlargement of the central legislative council and of the legislative councils in the provinces, parliament showed itself not out of sympathy with congress aspirations. Members of the councils were nominated, not elected, but in practice nominations made by the local bodies or corporations were always accepted.

Indian government remained a benevolent despotism, subject to criticism and advice from the councils, without these having any power in the executive field. The height of centralisation and, it may be added, of efficiency was reached under the viceroyalty of Lord Curzon (1899-1905). He reformed education and the police, expanded schemes of education, rescued the ancient monuments from neglect and decay, reversed frontier policy, and created the N.W. frontier as a separate province. His partition of Bengal, a purely administrative measure, gave to the nationalist movement a new rallying cry, and provoked the first violent demonstrations against British rule.

These became more serious in the viceroyalty of Lord Minto (1905-10). Terrorism, leading to the assassination of officials, made its appearance. Boycott of British goods was organized. While arming the government with additional powers to deal with this situation, the viceroy urged a further instalment of reform. Lord Morley, the then secretary for India, was in sympathy with the request, and the India Councils Act of 1909 was passed.

India Councils Act, 1909

By the Morley-Minto reforms, Indians secured an Indian majority, nominated and elected, in the provincial legislatures and a seat in the executive councils of the governors. In the central legislature for all India, an official majority was still retained, but here also a seat in the executive council was given to an Indian. Lord Morley contested the view that this led, directly or indirectly, to parliamentary government, but events were to prove him wrong. One feature of the act that had great consequences in the further political development of the country was that the Muslims, as a minority community, were given a separate electoral register with a fixed number of seats in the legislatures.

For a time it seemed as if Indian political aspirations had been met. In 1911 King George and Queen Mary visited India, and at a magnificent durbar at Delhi it was

announced that the capital was to be transferred from Calcutta to Delhi, that the partition of Bengal was to be reversed, and a new province of Bihar and Orissa would be created out of what had been Western Bengal. Yet in the following year, on making his state entry as viceroy into Delhi, Lord Hardinge (1910-16) was wounded by a bomb thrown from the crowd.

The First Great War stilled political unrest for a short while. India made a magnificent contribution to the forces of the Empire. Its small army of 150,000 was expanded by voluntary enlistment to over a million. The Indian states gave lavishly of their resources, and when peace came the Indian government made a contribution of £100,000,000 to the expenses of war beyond the heavy costs that it had incurred. The resignation of the secretary of state, Austen Chamberlain, followed on revelations of the mismanagement of the campaign in Mesopotamia.

Demand for Home Rule

Political agitation revived in more active form after the appointment of Lord Chelmsford as viceroy in 1916. Now the demand, sponsored by Annie Besant and B. G. Tilak, the formidable Brahmin who had assumed the leadership of the Congress party, was for home rule for India. The claim was that by its services in the war India had won the right to freedom. One early outcome was the visit of Edwin Montagu, secretary of state, to India, and the publication of a memorable report to parliament advocating a further great step in concession to the Indian demand. Mr. Montagu's visit had been preceded by the statement that the policy of the government was "the gradual development of self-governing institutions with a view to the progressive realization of responsible government in India as an integral part of the British Empire."

By this act of 1919 legislatures with elected Indian majorities were set up in eight provinces of British India and in Burma. Two chambers were created at the centre, and the executive council of the governor general was enlarged to seven, with three Indian members, but this council was not made responsible to the legislatures; they could debate and legislate, but they could not dismiss the government. In the provinces diarchy was introduced. A large group of "nation-building"

activities was placed in the hands of elected Indian ministers, responsible to the legislatures and dismissible by their adverse vote, while such matters as finance and law and order were left to the control of officials. It was the beginning of responsible government.

Rise to Power of Gandhi

These changes failed to satisfy the demands of the Congress party, which had now come under the influence of M. K. Gandhi. He preached passive resistance and "non-violent non-cooperation" as a means of bringing all government to a standstill, and engineered a pact with the Muslims, who had established the Muslim league in 1906 to counter the activities of the Congress party, but were now in agitation against the terms imposed upon the Turks by the treaty of Sèvres. The "non-violent" agitation quickly became one of violence in the Punjab, where it was sternly repressed by General Dyer at Amritsar (1919). Congress had transformed itself to a revolutionary body, with Gandhi promising *swaraj* (home rule) within a year.

Deluded by the disturbances in the Punjab, the Emir Ammunallah of Afghanistan, who had seized the throne after the assassination of his predecessor, Habibullah, attacked across the frontier. In a war in which large forces were engaged he was quickly defeated, and deprived of the subsidy that India had previously paid. Subsequently a rising of some of the frontier tribes had to be suppressed.

In India itself violent agitation continued, and was not allayed either by the visit of the duke of Connaught in Jan. 1921, for the inauguration of the new legislatures, or by that of the prince of Wales in Nov. 1921. Its most serious manifestations were the Moplah rebellion in Madras province, where the Moplahs, a fanatical sect of Muslims, attempted the forcible conversions of their Hindu compatriots, and the Chauri Chaura massacre, in which all the occupants of a police post were brutally murdered. Alarmed, Gandhi called for a suspension of the campaign of civil disobedience, but he was arrested, 1922, by order of the viceroy, Lord Reading (1921-1925). Meanwhile, Congress had boycotted the first elections to the legislatures. In the absence of Congress members, and with the cooperation of other parties, government under the new regime was carried on with some success.

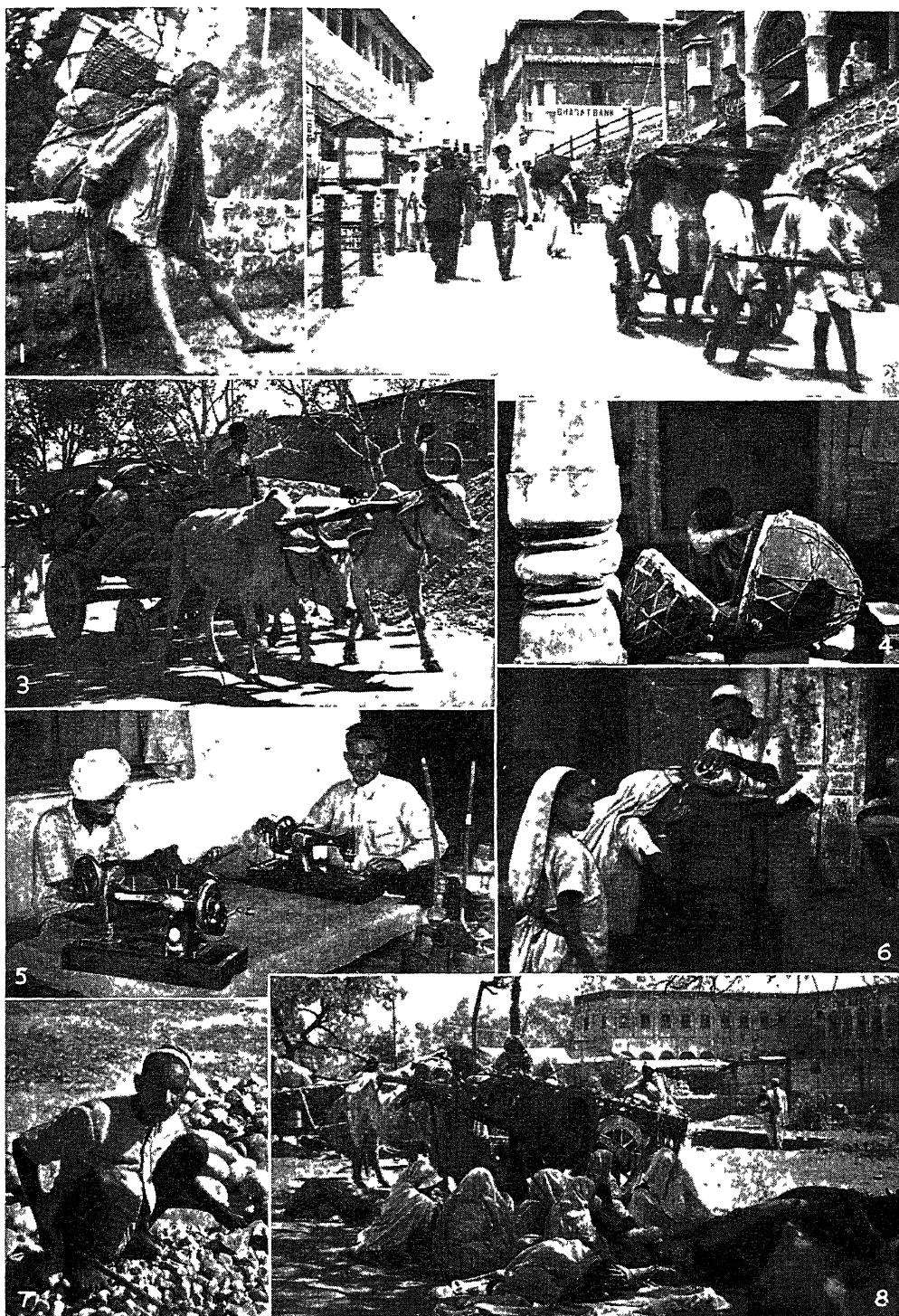
In the second elections in 1923 Congress entered the legislatures, "to make government impossible" from within. Agitation, accentuated by labour troubles, continued, and led to a dangerous terrorist movement, aimed at the lives of officials, in Bengal.

Yet it would be a false picture of India that confined itself to political movements. The life of the people went on. Industrial progress, stimulated by the shortages of the war years, and now participated in by Indians, was rapid. Reforms in the services, the lower grades of which had always been filled by a preponderance of Indians, brought a much larger proportion of Indians into the higher grades of administration. An agricultural commission, under Lord Linlithgow, suggested ways by which India could feed its rapidly growing population.

In 1928 the Simon commission, appointed to consider what further advance could be made towards self-government, visited India. Its work was the beginning of deliberations that extended over eight years, with three round table conferences in which Indians sat with British members of parliament, a joint select committee of the two houses of the British parliament and several subsidiary committees, leading up to the passing of the Government of India Act, 1935. This provided for immediate provincial autonomy in the eleven provinces into which it divided British India, and ultimately, after the consent of the Indian states, for a federation of All-India. It was accompanied by the announcement from the Viceroy, Lord Irwin (1926-29), that the ultimate goal was dominion status.

Successes of the Congress Party

Gandhi, who had attended the second round table conference as the sole representative of the Congress party, renewed his agitation on his return to India, and was again arrested. Nevertheless, the Congress party contested the first elections in 1937, and formed ministries in the eight provinces in which it obtained a majority. In the other provinces coalition ministries were set up. For two years the Act worked well, although the federal provisions never came into operation. The ministries found that they had real power. But there was increasing hostility between the Hindu and Muslim communities. As the final transfer of power came nearer, the repugnance of



1. Hill porter of the Himalayas carrying heavy load from a forehead strap 2. Street scene at a hill station 3. Four-wheeler bullock "truck," peculiar to Delhi and Karachi. 4. Temple drummer boy 5. Sikh tailors

working with modern sewing machines. 6. Pani wallah, or water vendor, in a bazaar. 7. Labourer breaking stones 8. Family pilgrimage to Birla Mandir, Delhi, the women wearing the customary bright yellow saris

INDIA: SCENES OF DAILY LIFE IN THE HILL STATIONS AND THE CITIES

Photos, G. Preston Wicks

the Muslims to Hindu rule crystallised into the demand for Pakistan—a division of India which would give a separate government to those areas in which Muslims were in a majority.

All smooth progress was arrested by the outbreak of the Second Great war. India's entry into this was resisted by the Congress party, which demanded a pledge of the independence of India at the end of the conflict. It refused all cooperation, rejected the offers of the Viceroy (1936-43), Lord Linlithgow, to form a popular executive, and forced the resignation of the eight Congress ministries in the provinces. Again Gandhi started a civil disobedience movement. In 1942, when the Japanese forces had swept through Burma and were on the borders of India, Sir Stafford Cripps went to Delhi with an offer that Indians should frame their own constitution at the end of the war. His mission failed to bring Muslims and Hindus into agreement, the former insisting, under the leadership of Jinnah, upon the unequivocal concession of Pakistan. On the demand from Congress that power should be at once given to a cabinet government with full control of Indian affairs and that British authority in India should cease, Sir Stafford closed the negotiations. With the breakdown the Congress party declared, in the words of Gandhi, for "open rebellion" and its leaders were promptly arrested. There followed an outbreak of sabotage that for some days interrupted communications with the armies fighting on the Burmese frontier.

The Second Great War

Through the whole period of political turbulence India made a magnificent contribution to the Allied resources in the war. Two million men were recruited as volunteers in the army; the small navy expanded, the air force grew to ten times its pre-war strength. Indian contingents fought over half the world, most conspicuously in the campaigns in Abyssinia, N. Africa, Italy, and Burma. At the same time a great expansion in industry enabled India to become the chief arsenal of supplies for the Empire forces fighting in the East.

One consequence was a complete change in India's financial position. Her debt to Great Britain, mainly incurred in the provision of rlys. and irrigation works, was redeemed, and India, owing to the division of war charges between

the two countries, became a creditor of Great Britain for an amount that at its height reached £1,300,000,000.

Further endeavours at reconciliation made during the war failed. Lord Wavell's renewed offer, at a conference at Simla, to create a popular government broke down over Jinnah's demand that no Muslim, other than a member of the Muslim league, should enter the cabinet. After the defeat of Japan, and with the coming into power of the Labour government, a British cabinet mission, consisting of Lord Pethick-Lawrence, Sir Stafford Cripps, and A. V. Alexander, tried to bring the Indian leaders to terms. The plan of future government which they evolved came to nothing through the resolute opposition of the Muslims. An assembly elected to frame a constitution met without its Muslim members, and without the participation of representatives of the Indian states. Almost its first act, under the leadership of Pandit Jawaharlal Nehru, who had become the active leader of the Congress party, was to declare that the future government of India would be that of a "sovereign independent republic."

A National Government

In Sept., 1946, a "national government" was formed, at first consisting of the nominees of the Congress party, the members of the Muslim league holding aloof, and with Pandit Nehru as chief minister. Subsequently the Muslim league entered the government, but the coalition worked uneasily, there being no real cooperation between the two sections. Lord Wavell (appointed 1943) resigned the viceroyalty in Feb., 1947, and Viscount Mountbatten, appointed his successor, went to India with the declared purpose of bringing British rule to an end. In an endeavour to shock the parties into agreement the British government announced its intention to withdraw from India not later than June, 1948. This again failed of its purpose. After intensive consultations in India, Mountbatten brought to London a plan of his own which conceded the partition of British India into two dominions, the one Muslim, the other Hindu, and involved the division of the provinces of Bengal and Punjab. British withdrawal was to be effected by Aug. 15, 1947, leaving two constituent assemblies to take over the tasks of government and to frame constitutions. British paramountcy

over the Indian states was surrendered to the states, leaving them free to enter one or other of the dominions if they so desired.

An act embodying this policy was rapidly passed, without opposition, through both houses of parliament in London. Viscount Mountbatten was appointed, at the request of the Hindus, governor-general of the new dominion of India, Jinnah becoming governor-general of Pakistan. Amid celebrations in India and in London, the flags of the two new dominions were flown on Aug. 15, 1947. British rule in India had ended.

Bibliography. Indian Year Book; The Rise of the British Power in the East, M. Elphinstone, 1887; A Short History of the British in India, A. D. Innes, 1902; The Government of India, Sir C. Ilbert, 1910; India, J. St. Loe Strachey, 1911; Oxford History of India from Earliest Times to 1911, V. A. Smith, 1919; Cambridge History of India, 6 vols., 1922-47; The Indian Civil Service, Sir E. Blunt, 1937; The Making of the Indian Princes, E. Thompson, 1943; The British in India, P. J. Griffiths, 1946; Caste in India, J. H. Hulton, 1947.

India, UNION OF. Independent republic within the British Commonwealth. The self-governing dominion of India came into existence on Aug. 15, 1947, with the transfer of sovereignty in British India to Pakistan and India; the latter comprising the United Provinces, Bihar, Bombay, the Central Provinces, Orissa, Madras, and Assam, plus the Calcutta area of Bengal and the E. half of Punjab, and with Delhi as its capital. The Indian Independence Act, July 18, 1947, decreed that from Aug. 15, 1947, H.M. government in the U.K. would have no responsibility for



India. Pandit Nehru, first prime minister of self-governing India displaying its flag

the government of territories until then included in British India; and recognized as the constituent assembly of the dominion of India the assembly convened Dec. 9, 1946, to take measures for the transfer of power from Great Britain to a united India, in which body the Muslim league had refused to take part. Under the act also the king ceased to be emperor of India, the relationship of the crown to the new dominions being similar to that established in reference to the other dominions (see Westminster, Statute of). On the recommendation of the Congress party the king appointed Lord Mountbatten, last viceroy of India, as gov.-gen., and on Aug. 15, 1947, he was sworn in by the new chief justice, Harilal Kania, and then administered the oath to the cabinet, headed by Pandit Nehru.

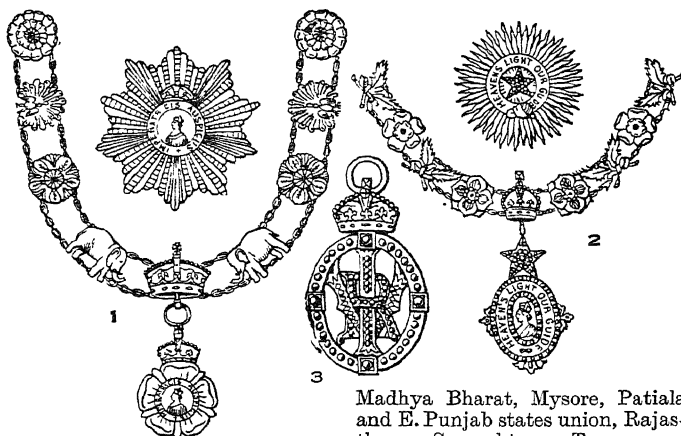
Partition of Punjab and Bengal

Boundary commissions, under the chairmanship of Sir Cyril Radcliffe, had been appointed on June 30, 1947. The one for Bengal consisted of two Hindus and two Muslims, the one for the Punjab of two Muslims, one Hindu, and one Sikh. By Aug. 17 they announced their proposals for the partition boundaries, and immediately the new Indian government, like that of Pakistan, was faced with its first serious problem. In the Punjab some few Sikh villages remained in Pakistan, some Muslim villages in India. Savage attacks were made by bands of one religion on isolated communities of the other, and millions of people were soon on the move.

During Sept. the two govts. improved a joint organization for the ordered evacuation of refugees; by the end of the year 8,500,000 persons had been transferred. Bad feeling between the communities continued, however, and on Jan. 13, 1948, Gandhi, at 79, began a fast to the death in the hope of bringing about Hindu-Muslim harmony. His action made an immediate impression. The shock of his murder by a Hindu fanatic on Jan. 30 had an even greater effect, and disturbances died down.

The last British troops left India Feb. 29, 1948; and on June 21 Chakravarti Rajagopalachari, gov. of W. Bengal succeeded Lord Mountbatten as governor-general.

In the course of 1947-49 accession to Pakistan or India of the princely states proceeded without difficulties between the dominions except in two instances. The Muslim ruler of Junagadh, a Kathia-



Indian Orders. 1. Collar, badge, and star, Indian Empire. 2. Star of India. 3. Badge, Crown of India

war state 450 m. from the nearest point of Pakistan, and with a predominantly Hindu pop., acceded to Pakistan. The neighbouring ruler of Nawanagar and the gov't. of India protested; Indian troops occupied the state; and a plebiscite resulted in a vote of 190,779 to 91 for union with India.

In Kashmir, the Hindu ruler of a predominantly Muslim state, much larger and more important than Junagadh, acceded Oct. 27, 1947, to India, an accession Pakistan refused to recognize. The resulting dispute is described under Kashmir.

When the pound sterling was devalued in Sept., 1949, the Indian govt. allowed the Indian rupee to follow the pound; Pakistan maintained the Pakistani rupee at its old value. A standstill in trade, and bitter ill feeling, followed.

By the end of 1949 the former princely states, with the exception of Bahawalpur and the Baluchistan states (acceded to Pakistan) and Kashmir, had all acceded to India. Many small states were integrated into neighbouring provs.; others were grouped into new unions.

A specially convened conference of Commonwealth premiers held in London, April 21-28, 1949, agreed to India's continuing to be a member of the Commonwealth despite her intention of becoming a republic; and in Nov. the constituent assembly produced a constitution that came into effect Jan. 26, 1950, setting up the republic of India, a union of the states of Assam, Bihar, Bombay, Madhya union (Central Provs.), Madras, Orissa, Punjab, Uttar union (United Provs.), W. Bengal (all former governors' provs.); Hyderabad,

Madhya Bharat, Mysore, Patiala and E. Punjab states union, Rajasthan, Saurashtra, Travancore-Cochin (all former princely states); Ajmer, Bhopal, Bilaspur (Punjab), Coorg, Delhi, Himachal union, Kutch, Manipur, Tripura, Vindhya union (all former chief commissioners' provs.); and the territories of the Andaman and Nicobar Is. The status of Kashmir was undecided.

The constitution abolished untouchability; established adult suffrage, a lower house of 500 members elected for five years on a territorial basis, and an upper house of 250, one-third to retire every second year. It also allotted powers and subjects of legislation between the central govt. and the states. Rajendra Prasad, president of the assembly, was elected unopposed first president of the new republic.

New communal violence in Assam and partitioned Bengal in Feb., 1950, and a two-way migration involving about a million people, led to a meeting between the premiers of India and Pakistan in April, and an agreement for the mutual care and assistance of minorities.

India, ORDERS OF. Three orders of knighthood. The most exalted order of the star of India was instituted by Queen Victoria in 1861 for bestowal upon Indian rulers and upon British subjects for services to the Indian empire.

The most eminent order of the Indian empire and the imperial order of the crown of India were instituted by Victoria in 1878, to mark her assumption of the imperial title. Award of the latter was restricted to wives and female relatives of Indians or of viceroys, governors, and principal secretaries for India.

Indiana. North-eastern state of the U.S.A. With Ohio to the E. and Illinois to the W., it lies S. of Lake Michigan, on which it has about 50 m. of coast. Its area is

36,291 sq. m. The surface is mainly an undulating plain, but attains some elevation along the Ohio valley, in which is Wyandotte Cave, with oolitic limestone used for building. Most of Indiana is drained by the Wabash (which forms part of the W. boundary) and its affluents, and by the Ohio, a natural S. frontier.

Indiana ranks high among the states for income from farm products and as a grower of maize. Crops and fruit include wheat, oats, rye, hay, tobacco, soya bean, potatoes, onions, tomatoes, apples, pears, peaches, and grapes. Stock raising and dairy farming are carried on. Two-thirds of the nation's peppermint and spearmint oil is yielded.

But this is predominantly a manufacturing state, with the Calumet region, including the lake ports and the steelworks of Gary, East Chicago, Hammond, and Whiting, one of the world's greatest industrial centres. Freighters bring iron ore from Michigan to artificial harbours in the Great Lakes, and carry away pig iron, limestone, Portland cement, coke, and the finished products of the steel mills. Oil refineries, machine shops, railway works, and the manufacture of agricultural machinery and motor cars employ many. Refrigerators, wireless sets, gramophones, pumps, furniture, and clothing are made, and there are meat-packing plants and flour mills. Mineral resources include coal and natural gas. Water transport is provided only on the Ohio, lower Wabash, and part of the White river, but there are 6,716 m. of rly., 16 lines radiating from the capital, Indianapolis.

Higher education is provided at the state university of Bloomington and at Purdue, De Pauw, Valparaiso, and Notre Dame (R.C.) universities. Two senators and 11 representatives go to congress. The "Hoosier state" was settled in 1732, made a territory in 1800, and joined the Union, Dec. 11, 1816. Pop. 3,427,796. *Consult History, L. Esarey, 2 vols., 1924.*

Indian Air Force. Indian military air unit formed in 1932. The first squadron was fully trained and equipped in 1939, and a number of first line fighter and reconnaissance units, their personnel in large part Indian, went into action on the Burma front. The prefix Royal was granted to the I.A.F. in March, 1945, but was abandoned in 1950. It was announced at the time of the partition of India (Aug., 1947) that the

air strength of the country would be divided. The dominion of India took over seven fighter squadrons and one transport squadron; and Pakistan one fighter and one transport squadron, with another fighter squadron to be formed as soon as possible.

Indianapolis. Largest city of Indiana and 20th largest in the U.S.A. It is the state capital and the co. seat of Marion co. Situated on White river, 110 m. N.W. of Cincinnati, Indianapolis is the largest city of the U.S.A. not on a navigable body of water. It is on the most direct E.-W. air line route and has five airports, also 16 rly. routes, all of which are interconnected, and two coast-to-coast motor coach systems.

Indianapolis is one of the best-planned cities of the U.S.A., with broad, tree-lined streets, and parks covering more than 3,200 acres. Most of the public buildings are of limestone quarried in the state; they include the capitol, the state house, and public library. Indiana university, Butler university, and the Jordan conservatory of music are among educational institutions. At Speedway City, a manufacturing town within the city, is the Indianapolis motor speedway, the

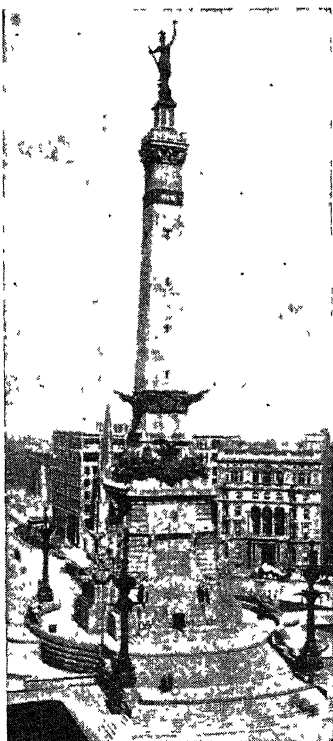
scene of the annual international 500-m. motor race held May 30.

Indianapolis is a distributing centre for livestock, grain, and meat, and one of the chief manufacturing centres in the country, producing rly. rolling stock, aircraft engines, motor car parts, wireless sets, gramophones, furniture, machinery, silk stockings, and pharmaceutical goods. Chosen as the site of the capital in 1820, it was incorporated in 1832 and chartered as a city in 1847. Pop. 386,972.

Indian Army. THE. Military formation serving normally in India. It grew up from the Bengal, Madras, and Bombay armies of the E. India Co. Under the co. the officers were supplied by the co.'s military college at Addiscombe, Surrey, or by direct appointment. The total strength, including local and irregular troops, was some 38,000 Europeans and 350,000 natives.

After the Mutiny, the East India Co. ceased to rule, Sept. 1, 1858, and the army became a part of the forces of the British crown. The local European corps were abolished; the artillery became wholly British, except for a few mountain batteries; and the number of native troops was greatly diminished. In 1861 the Indian staff corps was formed to provide a body of officers for service in India. In 1863 the system prevailing in the Punjab frontier force was applied to the whole army, seven British officers being attached to each unit to carry out the higher regimental duties. Many other reforms were effected between 1885 and 1904, the term Indian Staff Corps being replaced by that of the Indian army in 1903.

Under Lord Kitchener the whole army was reorganized, and recruits were more definitely sought from the martial stocks, the principal classes and races enlisted being Punjabi, Muslims, Sikhs, Pathans, Dogras, Jats, Marathas, Rajputs, Madrasis, Gurkhas, and Garhwalis. The Gurkhas, who provided 20 battalions in peace-time, are not Indians and have very little in common with the inhabitants of India, whom they heartily despise. After the breakdown of the Indian army administrative services in the field during the First Great War, the supply, remount, and ordnance services were placed on the same footing as that prevailing in other armies. In 1914 India dispatched forces to Mesopotamia, East Africa, Egypt, and France, where they were used against white troops for the first time. In



Indianapolis. Soldiers' and sailors' monument in Circle Place, 285 ft. in height

1919 came the 3rd Afghan War of a few weeks' hard fighting, and then three years of operations on the N.W. Frontier, followed by another reorganization. Almost half the cavalry was abolished; the Carnatic and Pioneer regiments were disbanded in 1923 and 1932 respectively; and a reduction of several thousand was made in the number of men of the British army to be maintained in India. The army was divided into four commands, and the troops holding the frontier were kept fully mobilised. In addition the Peshawar, Rawal Pindi, Quetta, Mhow, and Meerut divisions were considered to be field army formations. Motor transport companies were formed. The infantry of the famous corps of guides was absorbed into the infantry of the line. The cavalry regiments were reduced from 39 to 21, and the infantry battalions increased from 129 to 140.

In Oct., 1918, Indians were admitted to commissions with the

was also the problem of replacing the skilled tradesmen serving in technical arms.

In 1947 the army was divided between the newly created dominions of India and Pakistan, 15 infantry regiments being transferred to India and 8 to Pakistan, 12 armoured corps units to India and 6 to Pakistan; 18½ artillery regiments to India and 8½ to Pakistan, and 61 engineer units to India and 34 to Pakistan. Eight of the Gurkha battalions continued to serve in the British army. See Gurkha.

Indian Bean OR CATALPA (*Catalpa bignonioides*). A tree of the family Bignoniaceae. A native of N. America, it has large heart-shaped leaves in whorls of three. The fine, bell-shaped flowers are white, spotted with yellow and purple, and borne in large, pyramidal clusters of a hundred or more. The seed capsule is very long, suggesting a bean-pod, and contains numerous seeds with fringed wings.

Indian Civil Service.

Former organization for the civil administration of British India. For the higher posts, recruited by open competitions held every summer, natives of India were eligible: the limits of age were 22-24. Competition was keen, but success was attainable with a good general education and proficiency in classics, modern languages, mathematics, mental and moral science, or physical or natural sciences. Sound health was an essential condition. Successful candidates, having spent a year at a university, receiving £200 to defray the cost, were examined in Indian law and history and a native language, and in riding. In the administrative branch prospects might extend to the control of a province, and in the judicial to a judgeship in the Indian high court. Civil administration in India was reorganized after the creation of the dominions of India and Pakistan in 1947.

Indian Club. Wooden club, partly bottle-shaped, used in gymnastic exercises. Made of willow, elm, maple, or other wood, it averages about 2 ft. in length, and weighs 2 to 4 lb. The clubs are normally used in pairs.



Indian Cress. Leaves and flowers of the nasturtium

Indian Corn. Term of U.S. origin for the cereal known in the U.K. as maize. See Maize.

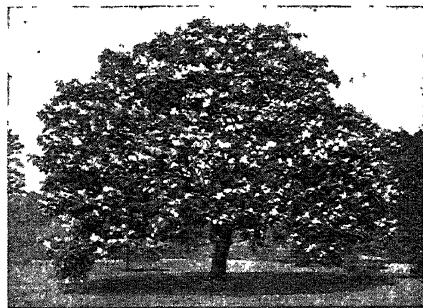
Indian Cress (*Tropaeolum*). Genus of annual and perennial twining herbs of the family Tropaeolaceae. They are natives of S. America. The handsome, irregular flowers end backwards in a long, nectar-containing spur. The few large seeds are each separately enclosed in a thick, ultimately spongy rind. The favourite nasturtiums of gardens are *T. majus* and *T. minus*, and the canary creeper is *T. peregrinum*. Green fruits of the first two are used as substitutes for capers. *T. tuberosum* has an edible tuberous root.

Indian Cup (*Sarracenia purpurea*). A perennial herb of the family Sarraceniaceae, native of N. American bogs. The leaf-stalks are hollowed out to form erect, trumpet-shaped pitchers, with a wing down one side, and the real leaf forms an arching, but never closed, lid. Within the mouth of the pitcher a sweet fluid is excreted, below that is a band of polished surface, and lower still a fringe of downward pointing hairs. Insects enter to sip the sweet fluid, and, venturing farther, lose their foothold on the polished surface and fall into the lower part of the pitcher, which is filled with a clear fluid exuded by the plant. Climbing out is all but impossible owing to the fringe of hairs; and all but the newest pitchers show a thick deposit of decomposing insects at the bottom. The proteins dissolved out of these victims are absorbed by the plant. The large, solitary purple flower is borne on a tall leafless stalk. Another species (*S. flava*) has pitchers 2 ft. long.



Indian Cup. Hollowed leaf-stalks in which insects are trapped

Indian General Service Medal. Campaign medal instituted in 1854 at the suggestion of Lord Dalhousie for Indian troops and British troops serving in India. Originally awarded for service in the Burmese war of 1852-53, it



Indian Bean, a North American tree

same status as British officers. The Indian military academy, at Dehra Dun, was established in 1931. No Indian officers were commissioned in the Gurkha regiments, whose Gurkha officers received their commissions from the viceroy, thus having a status below that of British officers. The Indian artillery was revived as field artillery in 1935; and the mechanisation of the cavalry was begun in 1938. In the Second Great War units of the Indian army served in France, Malaya, Burma, Iraq, Persia, Syria, Palestine, Greece, N. and E. Africa, and Italy. With the formation of an interim Indian government in 1946, the entry of British officers into the Indian army ceased, and all British troops were removed from Indian formations. The contracts of British officers serving with the Indian army terminated with the end of the Indian Empire, Aug. 15, 1947, and the new army was faced with a grave shortage of officers. There

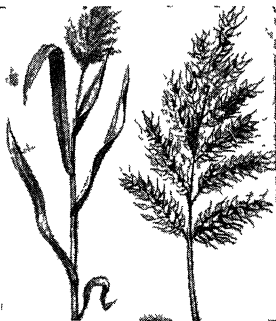
was issued for campaigns and expeditions until 1895; appropriate clasps were provided for each campaign, some 23 in number. In 1895 a new medal was authorised with a ribbon of red and green in five equal stripes. This was replaced by the medal of 1908, which had a green ribbon with a blue central stripe. In 1936 a fourth Indian general service medal began to be awarded to British and Indian troops serving on the North-West Frontier. The obverse carries a crowned effigy of the king, and the reverse a tiger and view of the frontier. The ribbon has a broad central stripe of khaki flanked by thin red stripes and edged with green; this was the first British medal ribbon to incorporate a khaki stripe.

Indian Ink. Specially prepared form of black ink. It is also called China ink, in which form it is sold in cakes or sticks and moistened with water for use. The chief constituent is lamp-black mixed with a thin glue. It produces an absolutely black and imperishable mark. See Ink.

Indian Medical Service. Former British military and civil service in India. Its history goes back to the appointments of surgeons by the East India Company. In 1896 the Indian Medical Service was created by the amalgamation of the three "establishments" of Bengal, Madras, and Bombay. In 1853 appointment was opened to Indians. Entrance was by competitive examination. Officers were posted to military, chiefly regimental, duty, or to civil employment, e.g. surveillance of prisons, inspection of sanitation, vaccination, etc.; attendance on civil officers in the district; or work in medical colleges or research depts. Following the establishment of the dominions of India and Pakistan in 1947, the Indian Medical Service was reorganized.

Indian Millet

(*Sorghum vulgare*). Grass of the family Gramineae, native of Asia. It has long, flat leaves, and a much branched, loose panicle of flowers. The large, round, hard seeds when ground yield an excellent white flour, which, in the warmer parts of Europe and in Asia, takes the place of oats and barley.



Indian Millet. Left, stalk and leaves; right, flower-head

Indian Mulberry (*Morinda*). Genus of shrubs and trees belonging to the family Rubiaceae. They are natives of the tropical regions of Asia and Australasia. They have



Indian Mulberry. Leaves, flowers, and berries of *Morinda citrifolia*

opposite (occasionally whorled) leaves and small flowers in dense heads. The small berries are edible, but insipid. The roots and bark produce red and crimson dyes.

Indian Mutiny. Name popularly given to the great revolt which broke out in India in 1857, because the struggle began with mutinies among the native regiments, though its continuation was by no means confined to them. The highly complex causes are traced in the article on India. The uneasiness then prevailing among the native princes and people and the disaffection among the native regiments were not realized by the British authorities, whose white troops, moreover, were just then reduced in number as a result of the Crimean War.

The actual occasion of the mutiny was an ill-advised order by the government that in future enlistment in the Bengal army was to carry with it obligation to serve overseas, though crossing the seas was forbidden under severe religious penalties to high-caste Hindus, who formed a large proportion of these sepoy armies. To this was added the blunder of ordering the issue of greased cartridges in which the fat of pigs and cows had been used, the pig being unclean to the Mahomedans and the cow sacred to the Hindus. When the blunder was discovered, an unobjectionable grease was substituted, but the sepoys

would not believe this. Between Jan. and May, 1857, isolated mutinies of regiments who refused to use the new cartridges were suppressed. But on May 10 a great group of native or sepoy regiments stationed at Meerut broke out, murdered their officers, and marched upon Delhi, where the Mahomedans proclaimed the restoration of the Mogul Empire. This probably restrained reigning Hindu princes who might otherwise have joined the revolt, since they had no wish for Mahomedan domination.

The revolt was, in fact, virtually confined to Hindustan, the territories through which the Ganges and its tributaries flow, above Patna on the border of Bengal proper. Here were many regiments of sepoys and thousands of the soldiery of the recently annexed kingdom of Oudh, besides the troops of semi-independent princes, but few of the queen's army. Outside this area mutinies were only sporadic, though it was long doubtful whether the disaffected elements could be held in check. The residency buildings at Lucknow, in Oudh, were held by a mixed force of white soldiers and loyal sepoys, and sheltered a crowd of civilians and white women and children. A small group of whites held out desperately for some weeks at Cawnpore, before which great rebel forces were collected under a Hindu magnate, Nana Sahib. But the main rebel force was at Delhi; and on the Ridge facing Delhi was gathered the main body of white troops and loyal sepoys.

Cawnpore surrendered on June 26. Most of the garrison were treacherously massacred when embarking to go down the Ganges under a safe-conduct; the women and children were held prisoners and were later butchered on the approach of Havelock's relieving force. On June 30 the massed mutineers began the siege of the Lucknow residency. The British on the Ridge besieging Delhi were themselves practically besieged. A handful led by Sir Henry Havelock made a dash for Cawnpore from Bengal, but were too late to save the garrison in spite of repeated victories in the face of almost overwhelming odds. Though Havelock struck into Oudh he was forced to fall back to Cawnpore and await reinforcements, while the Lucknow garrison held out.

At last, when John Lawrence from the Punjab was able to send help to the Ridge, John Nicholson fell, on Sept. 14, in the storming

of Delhi, which was completely mastered the next week. On Sept. 15 Havelock was joined by Outram, and on Sept. 25 they fought their way to Lucknow, and reinforced the garrison. Sir Colin Campbell (Lord Clyde) had now arrived to take the supreme command in India: fresh troops from home were accumulating. The tide had turned. On Nov. 17 Campbell relieved Lucknow, placed a strong garrison in the neighbouring fortress called the Alambagh, and then proceeded with the campaign of subjugation N. of the Ganges. Early next year Sir Hugh Rose opened the central Indian campaign in the revolted districts S. of the Ganges, and after the fall of Jhansi in June, there remained only the suppression of guerrilla bands. By the end of 1858 the last embers of the revolt were stamped out. See India: History.

A. D. Innes

Bibliography. History of the Indian Mutiny, J. W. Kaye and G. B. Malleson, 1888-89; T. R. E. Holmes, 5th ed. 1898; Sir G. W. Forrest, 1904-12.

Indian Navy. Naval forces of the Union of India. The first organized navy to be formed in the country was the Honourable East India Company's Marine formed in 1612 to defend its interests in

East Indian waters. In 1686 its title was changed to the Bombay Marine, and in 1830 it became the Indian Navy. Reorganized in 1892, as the Royal Indian Marine, in 1934 it became the Royal Indian Navy under the command of a flag officer of the Royal Navy. Its ships flew the white ensign and its officers served in British as well as Indian ships. During the Second Great War most of its ships, several built in Indian dockyards, were escort and patrol vessels, minesweepers, and submarine chasers. Units served against Italian Somaliland and Eritrea, and in Persian, Burmese, and Far Eastern waters.

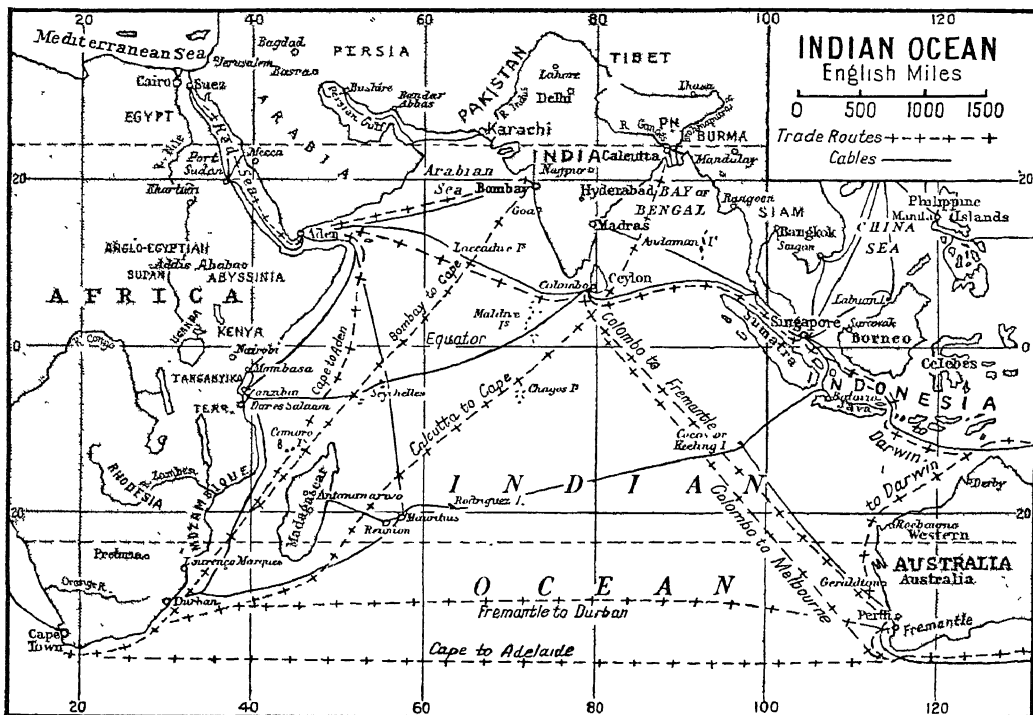
A serious mutiny which broke out among the ratings in Bombay on Feb. 19, 1946, and lasted some days, spreading to Karachi and Calcutta before it was suppressed by force of arms, caused serious anxiety to Indian political leaders, expecting shortly to take control of the navy, as well as to the actual commanders. The prefix Royal was dropped in 1950.

When the dominions of India and Pakistan were formed in Aug. 1947, vessels of the Indian navy were divided between the new states, one-third of their total strength going to Pakistan and two-thirds to India.

Indian Ocean. One of the great oceans of the world. The depth conditions are fairly uniform, for about two-thirds of the total is covered by water of over 2,000 fathoms. In four areas depths exceeding 3,000 fathoms are attained; they lie near the E. margin of the sea. To the N. and W. are many islands, rising from submarine ridges which have a general N. to S. direction.

The most important of the islands are Madagascar and Ceylon, but there are many small coral groups. Southwards a large area of less than 2,000 fathoms in depth helps to mark a distinction from the South Seas. The E. part of the Indian Ocean is remarkable for its vast unbroken expanses of water, interrupted only by the Cocos group and Christmas Island. The S.E. trade crosses the equator during the northern summer to become the S.W. monsoon, and the N.E. trade in the opposite season is similarly deflected. See Monsoon; Ocean.

Indian Order of Merit. Military and civil decoration awarded for gallantry by the British government to natives of India. It was instituted in 1837 for conspicuous bravery in action by officers and men of the Indian army. There were originally



Indian Ocean. Map of the tropic sea showing the trade routes and cable lines connecting Australia, Asia, and Africa

three classes, but the highest was abolished in 1902 when Indian troops became eligible for the V.C.



Indian Order of Merit, star and ribbon

The military division has two classes, appointments to the first being made only from members of the second. The badge of the first class is a silver eight-pointed star with a centre of crossed swords in gold and the inscription *Reward of Gallantry*; the second class has the centre inscription in dark blue enamel. Both classes of the military order are worn suspended from a dark blue ribbon with red edges. The badge of the civil division, awarded for gallantry in aid of the public authority or the safety of others, is a silver eight-pointed star with a centre of dark blue bearing a wreath and the inscription *For Bravery* in gold. It is worn from a ribbon of dark red with blue edges.

Indian Red. Natural red earth imported from Bengal. Originally brought from the Persian Gulf, and so sometimes known as Persian red or terra Persica, its colour is due to the presence of sesquioxide of iron in the earth. Of great staining power, it is used to make industrial paint.

Indian Reservation. An area in N. America set aside for the American Indians. The reserve system, founded on the principles of segregation and guardianship for the Indians, provided for communal ownership of the land, with administration by an agency of the federal government which could lease timber and mineral resources for the benefit of the tribes. The Dawes Act of 1887 allowed individual Indians to acquire and develop allotments. Congress in 1924 conferred citizenship on all the Indians, but not all are permitted to vote, since the separate states fix conditions. Reservations in 25 states, mostly in the W. and S.W., now comprise about 56,000,000 acres; the Navajo Reservation covers 25,000 sq. m. in Arizona, Utah, Colorado, and New Mexico. The office of Indian affairs has under its jurisdiction 393,622 Indians in the U.S.A. and 32,750 Indians, Eskimos, and Aleuts in Alaska.

In Canada, where a similar policy has been followed, the territory set

aside for the Indians amounts to 5,570,951 acres. There are reservations in all the provinces, the most extensive being in Ontario, Saskatchewan, and Alberta. The department of mines and reserves is responsible for them. Pop. 125,686. See American Indians.

Indian Service Medal. Instituted by King George VI on June 6, 1946, for personnel of the Indian army, navy, and air force who had served for three years in non-operational theatres of war. The medal is worn from a dark blue ribbon having light blue stripes. Recipients are not eligible for the Defence Medal (*q.v.*).

Indian Summer. Term used to denote a period of summer-like weather occurring in autumn. Although markedly warm weather is not exceptional at this time, there is no evidence that such a spell tends to recur regularly. The term originated in the U.S.A. A warm spell about Oct. 18 is sometimes referred to as S. Luke's summer, and one about Nov. 11 as S. Martin's summer, from the respective saints' days.

Indian Territory. A former territory of the U.S.A., now included in the state of Oklahoma.

It constituted part of the Louisiana Purchase, and in 1829 was assigned by congress as the domain of Indians living E. of the Mississippi. Cherokees, Creeks, Choctaws, Chickasaws, and Seminoles began to move hither in 1833. The tribes occupied distinct portions of the territory, and were granted the right of self-government. Each tribe appointed a principal chief or governor, and had a legislature, national court, and other institutions based more or less on the state system, while an international council consisting of representatives of each tribe met periodically.

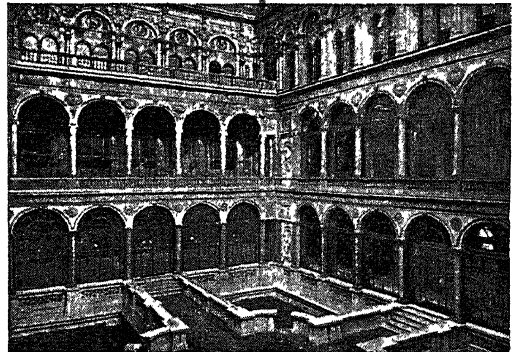
With the advent of white settlers it became necessary to modify this form of government. In 1897 the U.S.A. assumed jurisdiction over the courts, and in 1898 authority over property. By 1906 communal ownership had been abolished in favour of individual possession. In 1905 an overwhelming vote of the inhabitants was

cast in favour of statehood, but in 1907 the territory was joined with Oklahoma territory to form the state of Oklahoma. The pop. then was 681,115 (101,200 natives). See Oklahoma.

India Office. Former department of the British government. When the Government of India Act of 1858 transferred to the crown the functions of the East India Company and the board of control, a new department of the home civil service, the India office, was created under a secretary of state. Designed by Sir Gilbert Scott, the building housing the India office was opened 1867. It has frontages to King Charles St., S. James's Park, and Whitehall.

The India office was responsible for all such business connected with Indian public affairs as was transacted in the U.K. At first its cost was defrayed entirely from Indian revenues; the Treasury later made a contribution.

The Government of India Act, 1919, provided for the appointment in London of a high commissioner, whose functions were to take over on behalf of the Indian Government that work of the India office which was in the



India Office. Central court of the government building in Whitehall which housed the India office from 1867 to 1947

nature of agency, as distinct from administrative supervision and control. The high commissioner dealt with trade, pay, and pensions of Indian officials in England, sale of publications, education and welfare of Indian students abroad, and represented India at international organizations. The India office remained the channel of communication between the British and Indian governments, and the secretary of state, assisted by a parliamentary and a permanent under-secretary, continued to be the agent of the crown. The governor-general and the governors of provinces were responsible to him for the exercise of their special

powers. Upon the granting of dominion status to India and Pakistan in 1947 the India office was abolished.

India Rubber

Plant (*Ficus elastica*). Large evergreen tree of the family Moraceae. It is a native of the East Indies, with glossy, oblong, leathery leaves, and is the source of Bengal rubber. Introduced from India in 1815 as a greenhouse plant, it has been cultivated extensively since, in a young condition, as a decorative perennial for the warm greenhouse, as a table plant, and for sub-tropical gardening, the pots of large specimens being sunk in the ground in summer. If the plant is kept in unheated rooms in winter its leaves will drop off.

A suitable compost consists of sandy loam three parts to one part of leaf-mould. Tall, "leggy" plants should have the growing-point nipped out. This induces a more bushy growth, and the resulting side-shoots may be used for propagation, after they have become firm at the base. Shoots at least 6 ins. long should be selected for the purpose, and if taken off with a "heel" soon root in the greenhouse. Table plants should be given at frequent intervals a few days in the lighter and moister atmosphere of the greenhouse, and should have their leaves sponged with tepid water to remove dust. In spite of the impression that is produced by its name—that this is the India rubber plant—its product is much inferior in quality to that of *Hevea* (Para rubber) and many other plants. See Rubber.

Indicative (Lat. *indicare*, to point out). In grammar, one of the modes or moods of the verb. It expresses the action as a fact positively or interrogatively or negatively. In inflexional languages the different moments of time are denoted by the present, past, or future tense, the person of the agent by pronominal suffixes; in analytic languages, such as English, by vowel-change or periphrasis and separate pronouns. See Grammar.

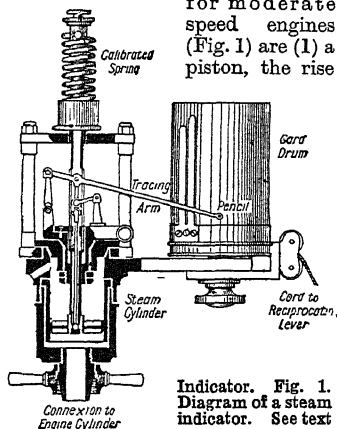
Indicator. Any instrument which indicates or records variations in the magnitude of an observed quantity, e.g. pressure



India Rubber Plant. Greenhouse specimen of the E. Indian tree

of the engine can be calculated, but from the diagram obtained useful conclusions can also be drawn in regard to the working of the engine, e.g. defects in valve setting, losses due to restricted exhaust.

The main parts of an indicator for moderate speed engines (Fig. 1) are (1) a piston, the rise



Indicator. Fig. 1. Diagram of a steam indicator. See text

of which is assisted by a calibrated spring, so that the rise of the piston is proportional to the pressure in the cylinder; (2) a system of levers giving a vertical rise of the pencil

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gauge, air speed indicator, automatic weighing machine, pyrometer, barometer. The term is also applied in chemistry to substances used for testing the acid or basic properties of solutions. As used for steam, gas, and oil engines, an indicator is an instrument which records variations of pressure in the cylinder during a working cycle. Its main use is to give information from which the "indicated" horse-power

of the engine can be calculated, but from the diagram obtained useful conclusions can also be drawn in regard to the working of the engine, e.g. defects in valve setting, losses due to restricted exhaust.

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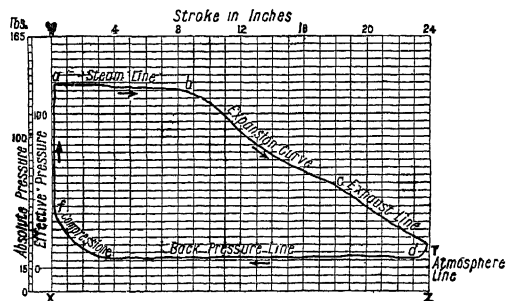
copy of the motion of the engine piston. The pressure cylinder is connected as directly as possible to the end of the cylinder from which a diagram is required.

Fig. 2 is a steam engine indicator diagram or "card" of a single stroke and return, as it appears when detached from the drum and laid out flat. Dimensions in the vertical direction (X-Y) are proportionate to the pressure on the spring, which has a known resistance; those in the horizontal (X-Z) direction to the known travel of the working piston.

At the beginning, *a*, of the stroke, when the pressure in the working cylinder is greatest, the pencil is raised to its highest point. The slight fall between *a* and *b* is due to the gradual throttling by the slide-valve of the steam as the piston moves forward. At *b* steam is cut off entirely; and the line *b c* shows the gradual fall in pressure while the steam is working expansively. At *c* the exhaust port opens just before the end of the stroke, and pressure falls to slightly above atmospheric, and so remains during the return stroke until *e* is reached, when the exhaust valve shuts. The trapped steam is compressed—as shown by the rise of curve from *e* to *f*—and "cushions" the piston.

The mean effective pressure can be ascertained either by a system of mid-ordinates or indirectly by use of a planimeter which measures the area of the diagram. This area divided by the length of the diagram gives the mean height, from which the mean effective pressure is deduced.

Horse-power developed in one end of the cylinder is calculated on the formula $P L A N / 33,000$, where *P*=mean effective pressure in lb. per sq. in.; *L*=length of stroke in ft.; *A*=area of piston in sq. ins.; *N*=number of working strokes per min. The useful h. p. delivered, known as brake horse-



Indicator. Fig. 2. Diagram showing variation in pressure in a steam-engine cylinder with the travel of the piston. Divisions on scale of 5 lb. pressure. See text

power (b.h.p.), is the difference between indicated h.p. and friction h.p. (f.h.p.), and is measured by means of a friction brake or other form of dynamometer.

At slow speeds the pencil of the indicator more or less follows the pressure variations, but at high speeds the pencil mechanism oscillates, forming ripples which distort the diagram, even with very light moving parts, so that the diagram is no longer a correct record of pressure variations in the engine cylinder. A sudden rise of pressure during combustion, such as occurs in the cylinder of an internal combustion engine, will cause the pencil to indicate too high an initial pressure, and the diagram may be distorted for an appreciable portion of the stroke. The type of indicator shown in Fig. 1 is unreliable for these and other reasons with speeds exceeding 200 r.p.m., but smaller indicators with very light moving parts are fairly reliable up to 300 r.p.m. Beyond this a different type of indicator must be used.

In one type suitable for high speeds, the Farnborough, a light disk is subjected on one side to the varying pressures in the cylinder and on the other to the pressure of compressed air, which can also be varied. When the pressure in the cylinder is very slightly greater than that of the compressed air, the disk rises from its seat and closes an electrical circuit, generating a spark between the pencil and a drum rotating at engine speed. A sheet of paper fastened to the drum is perforated by this spark. The compressed air also presses on a spring-controlled piston which moves the pencil axially, so that the distance of the pencil from its zero position is proportional to the air pressure on the piston (and therefore on the disk).

The circumferential distance from the dead centre position is proportional to the angular movement of the crank, so that the diagram for an internal combustion engine is similar in shape to Fig. 3. AB is the compression line; at B ignition begins and the pressure rises rapidly to C; combustion continues from C to E; EF shows the fall of pressure during the expansion stroke.

This diagram, however, has a time base instead of a stroke base and, while it is of considerable value for studying the ignition process and heat losses, it is not suitable for ascertaining indicated h.p. until it is converted by a somewhat laborious process. The

friction h.p. of a high-speed engine can, however, be obtained in other ways (see Mechanical Efficiency) and the brake h.p. can be measured directly (see Horsepower) so that the above disadvantage is not serious.

Another type of indicator used for high speed engines is the cathode ray indicator, in which a fine pencil of electrified particles produces a spot of light at the end of an evacuated glass tube, this pencil being deflected according to the pressure in the engine cylinder. A diaphragm which deflects and alters the capacity of an electrical condenser, or a carbon pile, the resistance of which alters with the pressure, is used to produce the deflecting current. Deflection in a direction at right angles to the pressure deflection is produced by an armature rotating at the same speed as the crankshaft. A diagram similar to Fig. 3 is produced, and this can be traced or photographed. The instrument has a number of uses, e.g. recording variations of pressure in fuel systems or in pipe lines, examination of exhaust pulses. See Cylinder; Gas Engine; Ignition; Instrument Panel; Motor Cycle; Steam Engine, etc.

Indicatrix. A conception in optical crystallography. It was suggested by L. Fletcher (for details, consult his *Optical Indicatrix and the Transmission of Light in Crystals*, 1892). The optical structure of uniaxial crystals can be represented by an ellipsoid of revolution, the uniaxial indicatrix. The ellipsoid of revolution for any particular uniaxial mineral is so constructed that axes are inversely proportional to the maximum and minimum indices of refraction. From this geometrical construction, it is possible to obtain the directions of vibration of the ordinary and extraordinary rays (see Uniaxial Crystals) derived from any single incident ray of light. Similarly, the optical structure of biaxial minerals may be represented by

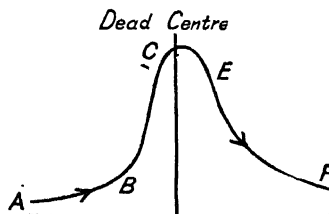
an ellipsoid, the biaxial indicatrix. In this case the axes are made proportional to the minimum (α), intermediate (β), and maximum (γ) indices of refraction, and the indicatrix shows the character of the optical symmetry and the velocity and plane of vibration of any light ray traversing the crystal. See Crystallography, etc.

Indices. In mathematics, the symbols denoting the power to which a quantity has been raised. Thus $a \times a \times a$ is written a^3 , and 3 is the index or power to which the quantity a has been raised. The index may be positive or negative, being prefixed in the latter case by a minus sign, as 300×10^{-6} , a figure given for the wavelength of ultra-violet light (in mm.). Index notation is very convenient in everyday mathematics, as when 29^2 is written for 29 squared; or 14^3 for 14 cubed. It forms the basis of calculation by logarithms (*q.v.*), and is indispensable in expressing concisely very large quantities or very small ones. Thus:

$$\begin{aligned} 10^6 &= 1,000,000 \\ 10^3 &= 1,000 \\ 10^{-6} &= \frac{1}{1,000,000} \\ 10^{-12} &= \frac{1}{1,000,000,000,000} \end{aligned}$$

Indiction (Lat. *indicere*, to announce). Originally a proclamation or declaration. It was used by the Romans in this sense. In chronology it was used for a period or cycle of 15 years, and also for a year in the cycle. The indictions were first reckoned from Sept. 1, 312 B.C., but afterwards from the birth of Christ. This system, which is said to have been introduced by Constantine the Great, was widely used in the eccles. chronology of the Middle Ages. See Calendar.

Indictment (late Lat. *indictare*, to point out). English law term for a written statement showing the crime of which a prisoner is charged. Formerly the accused could be tried by a petty jury only after a grand jury had considered the bill of indictment and the evidence for the prosecution and had decided that the evidence disclosed a *prima facie* case, in which event they endorsed the bill with the words "true bill." Grand juries were abolished in 1933 apart from a few exceptional cases; and today the bill of indictment is signed by the clerk of assize, or in quarter sessions by the clerk of the peace, and becomes an indictment, upon which the accused is tried before a petty jury.



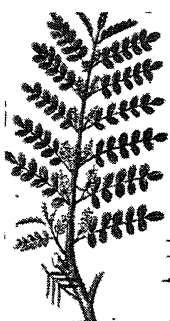
Indicator. Fig. 3. Diagram of pressure in an internal combustion engine. For key to lettering, see text

Formerly all indictments had to be written on parchment, and to specify with minute particularity the offence charged. The slightest flaw invalidated the indictment, and the prisoner went free. By the Indictments Act, 1915, it was enacted that indictments might be written on paper; and they were made less formal. All that is required is (1) a statement of the crime charged and (2) sufficient particulars to give notice to the prisoner of what he is really accused. Thus, an indictment for murder would now say, *Crime charged*: Murder. *Particulars*: That John Jones did on the 1st day of July, 1948, murder Thomas Smith, at 222, High St., Harlaw, by striking him with an axe. The judge has extensive powers of amending indictments. See Trial.

Indies. Name applied originally to certain regions of the East, India, Burma, Malay Archipelago, etc., which appears in such titles as the East Indies and West Indies. The extension of the term to the latter is due to the belief of early explorers that these islands formed part of the Asiatic group. See Indonesia; West Indies.

Indigirka. River of Asiatic Russia, in Yakutsk A.S.S.R. It rises in the Stanovoi mountains, and after flowing about 875 m. through a frozen desert, discharges itself into the Arctic Ocean near the settlement of Russkoye Ustye.

Indigo (*Indigofera tinctoria*). Sub-shrubby perennial of the family Leguminosae, native of the E. Indies. The long leaves are divided into from four to seven pairs of oval leaflets. The red pea-like flowers are borne in sprays from the base of the leaves, and succeeded by long, narrow pods. The West Indian indigo (*I. anil*) is a larger plant with pinkish flowers.



Indigo, leaves and flowers

The blue colouring matter obtained from the plant has been used as a dye from the earliest times, although in Europe the native woad (*Isatis tinctoria*) was long preferred. The dye is obtained by steeping and macerating the leaves in water. Fermentation occurs and the insoluble blue dye is reduced to a colourless soluble compound—indoxyl. The solution

is transferred to another vat and aerated, the indoxyl is reoxidised to indigo, and this is precipitated as a blue mud which is dried. The natural indigo dye is now largely supplanted by coal-tar products and synthetic dyes.

Indigo Bird (*Cyanospiza cyanea*). Member of the finch family, fairly common in the eastern parts of the U.S.A. The male has bright blue plumage, while the hen is bluish grey. The bird is about 5 ins. long and is a pleasing songster.

Indirect Waves. Term used in radio communication to describe those waves transmitted to a receiving station which pass through the ionosphere (*g.v.*), or upper atmosphere. It is these indirect waves which render long distance radio communication possible, and also give rise to the phenomenon of fading.

Indium. A metallic element, which has the chemical symbol In and falls in the third group of the periodic table with gallium and aluminium; atomic number, 49; atomic weight, 114.76; melting point, 155° C.; crystal form, face-centred tetragonal. The metal is silver-white, quite soft, extremely ductile, a little heavier than zinc. Although it has a relatively high boiling point it oxidises rapidly in air above its melting point and burns with a brilliant violet flame. Nitric acid dissolves it rapidly, hydrochloric and sulphuric acids only slowly.

Discovered by Reich and Richter from a spectral analysis of blende in 1863, indium recently became a metal of commercial importance. It occurs in the flue dust from zinc extraction plants, e.g. at Great Falls, Montana. Recovery of the metal is difficult, but it is obtained in its purest form by the electrolysis of a cyanide solution. When it is added to fusible alloys it gives them the lower melting points needed for surgical work. It is plated on to silver articles to enable them to take a high polish and to reduce tarnishing. By alternating indium and gold plating and then heating, a sky-blue colour is produced. Cadmium alloy and copper-lead bearings may be indium-plated to prevent corrosion by oils.

Individual (Lat. *in*, not; *dividere*, to divide). The indivisible, the being which forms by itself a complete whole. Logically, the individual is distinguished from others of the same species, which includes a plurality of individuals; metaphysically, from the absolute

substance which conditions and renders possible the existence of many individuals.

Individualism. Name given to a political and economic system that favours the development of the individual rather than that of the state or other association. It corresponds with an attitude of mind which places a high value on human personality. The antithesis of collectivism and socialism, like them it is variously defined, and appears in moderate and extreme forms. Individualism has found its strongest advocates and its main home among the English-speaking peoples, and its heyday was from about 1840 to 1880. It rested on the teaching of Adam Smith and Bentham, and was accepted with some modifications by J. S. Mill. An extreme exponent was Herbert Spencer. The creed of the average individualist is that the best results for mankind can be attained by giving free play to individual energy and initiative, applying this principle in the spheres of industry, morals, art, and speculation.

Since about 1880 there has been a strong reaction against individualism. In industrial practice competitive *laissez faire* had helped to produce conditions the reverse of satisfactory; science tended to emphasise the interdependence of the various forms of life; political philosophy, returning to Aristotle, dwelt upon the harmony that should exist between man and the state; and, most of all, practical life showed more and more how impotent was the individual standing alone. These factors tended to destroy individualism as a working creed, and since then legislation has been in the direction of collectivism of one kind or another.

The Soviet experiment in Russia gave an immense impetus to state planning, and this was reinforced by fascist and National Socialist ideologies in Europe, resting on the subordination of individual purposes to those of social, political, and cultural groups. During the Second Great War individual rights were everywhere invaded in the interests of total mobilisation of resources. Government controls (rationing, direction of labour, regulation of profits, censorship, nationalisation, etc.), have narrowed the field of private enterprise in all countries where Left parties are in power. In the U.S.A. individualism is still a force. See Collectivism; Socialism; Spencer, Herbert: State.

Indo-Aryan. A branch of the Aryan or easterly sub-family of Indo-European languages, the other being Iranian. Its 32 languages are spoken by well over 200,000,000 people. Perhaps over a million, mostly in Kashmir, speak Pisacha or non-Sanskritic languages developed after the Iranian split but before the tribal dispersion over India recorded in the Rig-Veda.

The older languages of the Sanskritic group now form an outer fringe, passing from W. Punjab round the S. (Marathi) to E. Bengal and Assam. In the upper Ganges plain the dominant W. Hindi, inheriting the purified literary form known as Sanskrit, is enclosed within an inner band of dialects gradually merging into the outer fringe. The term denotes also the social institutions and mythology of Aryan India. The people themselves are preferably designated Aryo-Indian. See Aryan; Ethnology; India.

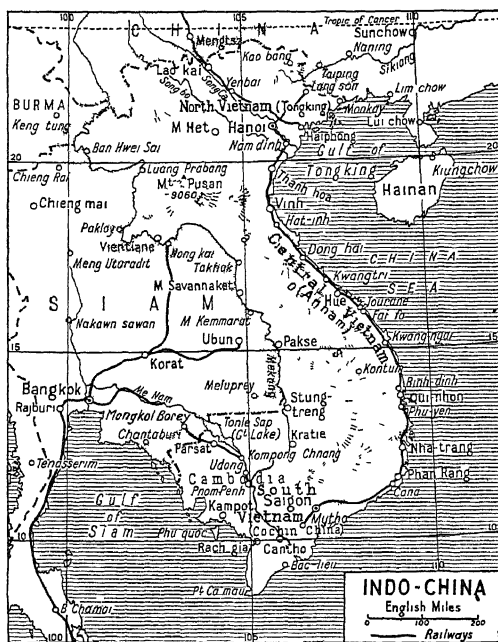
Indo-China. Name given to an area of S.E. Asia. As French Indo-China, it comprised the colony of Cochinchina, under a governor, and the protectorates of Annam, Cambodia, Laos, and Tongking (see entries under these names), each under a resident-superior, the whole area being under a gov.-gen.

In 1950 the French govt. ratified treaties recognizing Cambodia and Laos as autonomous kingdoms and Tongking (N. Vietnam) Annam (Central Vietnam), and Cochinchina (S. Vietnam) together as the state of Vietnam; all within the French Union.

Indo-China has a total area of about 286,000 sq. m. and a pop. of 27,000,000 including 43,000 French and 600,000 other foreigners, most of them Chinese.

Economically Indo-China is divided into three regions: the territory tributary to Saigon, almost wholly agricultural and one of the world's greatest rice-growing areas, made up of Cambodia, S. Laos, South Vietnam, and Central Vietnam S. of Cape Varella; the central part of Central Vietnam, also agricultural, exporting cinnamon, sugar, tea, and maize; and the territory tributary to Haiphong, comprising N. Vietnam, and the north part of Central Vietnam, devoted to agriculture, mining, and manufactures. Minerals include anthracite, zinc, tin, tungsten, bauxite, and manganese.

Indo-China has 3,344 m. of colonial roads and 8,778 m. of local roads. Rlys. run from Saigon to Mytho, from Hanoi to Saigon,



Indo-China. Map of the area of S.E. Asia associated with France

from Haiphong to Yunnan in China, from Pnom Penh to Mongkol Borey, and from Bendorix to Loeninh; a total of 2,093 m.

After the Franco-German armistice of June, 1940, Gen. Catroux, governor-general of Indo-China, adhered to Gen. de Gaulle, but could not bring over the territory, to which Vichy appointed Admiral Decoux as governor-general in his place. Japan demanded, and received in Sept., the right to set up air bases in Tongking, to station troops at Haiphong, and to send troops across the country to China. In Nov., Indo-China was involved in a frontier dispute with Siam. Japan intervened and negotiated a settlement by which the Paklay district of Laos, with an area on the right bank of the Me-kong river, was ceded to Siam.

Japan took over more bases in the following July, and on Dec. 8 invaded Siam, where she met only 5 hrs.' resistance. Japan then rapidly incorporated Indo-China into the economy of "greater Japan," although nominally still recognizing French sovereignty until, in March, 1945, she set up Annam as an independent state, under the name Vietnam.

When the Japanese surrendered in S.E. Asia, Sept. 12, 1945, the French were not in a position immediately to take over the administration of Indo-China. As a temporary measure, and by agree-

ment, Chinese forces occupied the country N. of the 16th parallel, and S.E.A.C. (British) forces the part S. of that parallel. The Chinese took over without incident. In the S., Anglo-Indian forces, with a small French contingent, found Saigon (Cochin-China) under the control of the Annamite independence movement Vietnam, whose leader, Ho Chi-minh, declared, however, that though the movement was strongly nationalist and opposed to a restitution of French rule, it was not

against the Allies. Clashes occurred, but French reinforcements arriving in Oct., the greater part of Indo-China was under French control by the end of Nov.

The French, with British mediation, had meanwhile been negotiating with Viet-minh. The French committee of national liberation had already, in Dec., 1943, declared that when liberation came a considerable measure of autonomy within the French community would be accorded to the territories of Indo-China; and when Admiral Thierry d'Argentine arrived at Saigon, Oct. 31, 1945, to take up the office of high commissioner, he confirmed this with consequent easing of the situation. The French took over responsibility for law and order on Jan. 1, 1946, and S.E.A.C. control of S. Indo-China ceased at midnight on March 4. The Chinese left north Indo-China during the same month.

A treaty signed at Pnom Penh on Jan. 4 between the French and the Cambodian premier recognized Cambodia as an autonomous unit of an Indo-Chinese union. Another treaty made at Hanoi on March 6 between Ho Chi-minh and the French envisaged the formation of a federation of Indo-China, and recognized the republic of Vietnam, comprising Annam and Tongking, as a free state forming part of this federation and of the French Union. Cochinchina wa

recognised on June 1 as another independent state of the proposed federation. Further negotiations in France and in Indo-China failed, however, Ho demanding the integration of all Indo-China into Vietnam; and fighting continued between the French and Ho's forces.

Treaties signed July 19 and Nov. 8, 1949, and ratified by France Feb. 3, 1950, recognized Laos and Cambodia as independent within the French Union. For the emergence of Bao Dai as leader of forces in Vietnam more conciliatory to the French, and subsequent events in that country, see Vietnam.

Indo-European. Name given to a people originally speaking a common language, the parent of what is now variously known as the Indo-European, Indo-Germanic, or Aryan family of languages. The name Indo-European, fairly representing the area over which these languages are spoken, is the most satisfactory. See Aryan: Ethnology; Philology.

Indole (C_8H_7N). White substance with a pearly lustre and disagreeable odour which was first prepared by heating oxindol, a product obtained from indigo, with zinc dust. It is, however, better made from dichloroether and aniline. The other name for indole is ketole. It occurs naturally in certain flower oils, and in the animal organism as a product of intestinal digestion. Indole is used in the preparation of neroli oils.

Indonesia. Geographical term for the E. Indian archipelago including Borneo and New Guinea

and sometimes the Philippines; since 1945 applied particularly to those parts of it constituting the former colonial empire called Netherlands (East) Indies. In this restricted sense Indonesia comprises Sumatra, Java, Madura, the Riau-Linggi archipelago, Banca, Billiton, Dutch Borneo, Celebes, the Moluccas, Dutch New Guinea, the Timor archipelago, Bali, and Lombok, all of which are described separately in this work. It has a total area of 735,267 sq. m., and a pop. of (1930) 60,727,233, including 240,417 Europeans, 1,233,214 Chinese, and 115,535 other Asiatic foreigners. In 1940 the total pop. was estimated at 70 millions. Some 60 languages are spoken, of which the most important are Javanese, Sundanese, and Madurese; but Malay is understood in most of the islands, and was the second official language with Dutch. Under Dutch rule all denominations enjoyed religious liberty. The bulk of the Indonesians are Mahomedans; Christians number some 2,500,000; Brahmans, in Bali and the W. of Lombok, 1,250,000; Buddhists, about 1,000,000; and there are heathen tribes in remote areas.

HISTORY. The first Europeans to explore Indonesia were Portuguese traders, who settled in some of the islands in the first half of the 16th century. English and Dutch expeditions arrived in the 1590s and ejected the Portuguese. The Dutch ousted the English, and in 1602 formed their East India company, which conquered the

islands one by one and ruled them until it was dissolved in 1798. During the French occupation of Holland, England seized the Dutch possessions in the E., restoring the Indies in 1816, from which date they came under the rule of the Netherlands government, represented by a governor-general.

With the opening of the 20th century the home government began a process of education in self-government, instituting first municipal councils and then, in 1918, a people's council (*volksraad*), in which Indonesian members gradually became preponderant. The revised Netherlands constitution of 1922 made the Netherlands Indies an integral and equal part of the kingdom of the Netherlands, and from 1927 the people's council shared legislative power in internal affairs with the governor-general. Of the council's 60 members—European, Indonesian, and foreign Asiatic—22 were appointed by the Netherlands government, 38 elected by the local councils; the chairman was appointed by the crown. The formation in 1927 of the National Indonesian party, which became in 1937 the Indonesian Nationalist movement, marked the rise of a strong independence movement.

SECOND GREAT WAR. Upon the capitulation of the Dutch army on May 14, 1940, the Netherlands government considered, but decided against, the possibility of establishing itself in the Indies, which remained, however, an important source of revenue to the government, of raw materials to the Allies as a whole. Japan's demands for economic concessions were refused; and after the bombing of Pearl Harbour by Japanese aircraft, Dec. 7, 1941, preparations were made, in conjunction with Australia, to resist a probable Japanese attack on the Indies. The rapid march of events left the main burden of defence in the hands of the Dutch authorities on the spot.



Indonesia. Map of the East Indian archipelago, part of which comprised the Netherlands (East) Indies

Their army, the bulk of it in Java, consisted of some 100,000 white and native troops. Their air force, small but efficient, comprised 200 bombers and 200 fighters. They had four cruisers, six destroyers, 18 submarines, and some motor torpedo-boats.

Japanese Conquest of the Indies

Japan massed a large fleet off French Indo-China, which was attacked repeatedly by the Dutch fleet. But the Japanese occupied Sarawak and Mindanao, thus gaining command of the Celebes Sea, by Dec. 20. On Jan. 10, 1942, two Japanese convoys sailed from Davao; one captured Tarakan off Borneo, the other Manado in Celebes.

A further convoy landed troops at Balikpapan in Dutch Borneo and at Kandari in Celebes. Yet another force occupied Amboyna.

On Feb. 14, 700 parachutists landed at Palembang in Sumatra; they were wiped out by the garrison, but the Japanese landed in force from the sea and rapidly secured the W. shores of the Sunda Strait. Bali was invaded Feb. 20. A week later an Allied squadron attacking a Japanese fleet heading for Java was virtually destroyed in a two-day running battle (see Java Sea, Battle of), and the Japanese landed 75,000 troops almost unmolested. Effective resistance ceased with the capture of Surabaya, Java, on March 8.

As Allied air power grew in the Pacific, Japanese bases in the Indies were heavily bombed. The Allied land and sea offensive reached Dutch territory with the landing of forces at Hollandia, New Guinea, April 22, 1944. The capture, June 20, of Biak Island, after more than three weeks' desperate resistance, gave the Allies control of New Guinea, though large pockets of Japanese still remained there. Morotai in the Moluccas was secured Sept. 14, and then the main Allied offensive swept N. to the Philippines. In 1945 Australian forces recaptured Tarakan May 1-June 24, and landed on Balikpapan on July 1. Operations were continuing in Borneo when Japan surrendered, Aug. 14.

UNITED STATES OF INDONESIA.

At the moment Japanese resistance ceased—much more suddenly than had been anticipated—the area covered by South East Asia Command (*q.v.*) was actually being extended, Java coming under it on Aug. 15, 1945. S.E.A.C. had at its disposal too few troops for immediate and adequate occupation of all areas under its authority;

and not until Sept. 28 did a token force of less than 2,500 British soldiers land in Java. The mission of this force, later increased to 96,000, was to rescue Allied prisoners and internees (c. 100,000), round up the Japanese, and take over the administration. But it found a "provisional Indonesian republican govt.", under Achmed Sukarno, in control of large areas; and in carrying out their mission S.E.A.C. troops had at times to counter armed opposition from Indonesians using weapons and ammunition transferred to them, against the surrender terms, by the Japanese. As Dutch troops became available, Anglo-Indian forces were withdrawn, the last leaving Indonesia Nov. 30, 1946.

Dutch-Indonesian Negotiations

The Netherlands govt. had already in 1942 announced its intention to reconstruct the kingdom after the war as a commonwealth in which each of its four parts (the homeland, the E. Indies, Surinam, and Curaçao) would handle its own internal affairs; but the "provisional Indonesian govt." refused to recognize Dutch sovereignty. The Dutch, on their side, objected to negotiating with what they regarded as a Japanese puppet administration. British mediation brought Dutch and Indonesians to negotiations which continued, with sporadic outbreaks of armed hostilities, until the signing of the Linggadjati agreement, Nov. 15, 1946, approved by the states general at The Hague, Dec. 20. This recognized the govt. of the republic of Indonesia as exercising *de facto* authority over Java, Madura, and Sumatra; and stipulated the formation of a federal United States of Indonesia. Differences over interpretation, and renewed fighting, followed. In July, 1947, India and Australia brought the position before the U. N. security council, which called on both sides to cease hostilities.

Parts of the area claimed by the republic broke away from it during 1948, and were recognized by the Netherlands as autonomous states. Resumed negotiations with the republic coming to nothing, the Dutch issued a decree on Dec. 19 providing for the formation of an interim federal govt. of Indonesia outside the republic; and on the same day re-opened military operations with the object of bringing the republic within the federation. The republican leaders were arrested.

On Jan. 28, 1949, the U.N. security council called on the

Netherlands govt. to release all political prisoners, and to establish a "federal, independent, and sovereign" United States of Indonesia by July 1, 1950. On Feb. 27, 1949, the leaders were released, and after further negotiations in Batavia, under U.N. chairmanship, a conference of Dutch, republican and non-republican Indonesian, and U.N. representatives, sitting Aug. 23-Nov. 2 at The Hague, reached agreement. The kingdom of the Netherlands undertook to transfer sovereignty to the republic of the United States of Indonesia, consisting of the *negaras* (autonomous states) of: the republic of Indonesia; E. Indonesia (Celebes, Bali, the Moluccas, Timor, Flores, Sumba, and some smaller islands); W. Java; E. Java; Madura; E. Sumatra; S. Sumatra; the *daerahs* (constitutional units) of: Central Java; Banka; Billiton; the Riau archipelago; W. Borneo (Kalimantan Barat); Great Dyak; Bandjar; S. E. Borneo (Kalimantan Tenggara); E. Borneo (Kalimantan Timur). The status of Dutch New Guinea remained to be decided.

The statute of the Netherlands-Indonesian union, signed at the same time, created organized co-operation between the two countries in all matters of common interest; recognized Queen Juliana, and her lawful successors, as head of the union; and laid down that a union conference must be held at least twice yearly.

These agreements were ratified by the republican parliament Dec. 14, and by the other states; and by the Dutch states general Dec. 21. Formal transfer of sovereignty took place Dec. 27, 1949. Batavia, under the name Jakarta, was constituted the capital of the U.S.I., of which Sukarno was elected first president on Dec. 16.

During March, 1950, the first conference of the Netherlands-Indonesian union opened at Jakarta; and merging of other *negaras* and *daerahs* in the republic of Indonesia began.

Indonesian. In ethnology, a term denoting an ethnic stock in S.E. Asia and adjacent archipelagoes. Descended from early Caucasoid populations intermingled with Mongoloid elements, these peoples are short, long-headed or medium-headed, wavy-haired, and olive to brownish-yellow. They include the Indian Ocean Nicobarese and Salons, Assam Nagas, Indo-China Khas and Moïs, non-Malay Borneans, Philippine Tagals and Igorots,

and Sumatra Battas, almost all showing ethnic admixture. In philology the term denotes a subfamily of the Austronesian division of the Austric family. Neither people nor language coincides with the Indonesian geographical region.

Indore. Former state of India now part of Madhya Bharat. Of the total area of 9,934 sq. m. only about one-fifth is under cultivation, grain and cotton being among the chief crops. The state (pop. 1,513,966) was one of the first to accede to the dominion of India.

Indore city, former state capital, now winter capital of Madhya Bharat, is an important commercial town. It contains the Daly College for Indian princes, trades in grain, tobacco, and opium, and lies on the Malwa Plateau N. of the Vindhya Mts., and on the rly. from Ratlam to Khandwa. The palace of the former maharaja is a fine building. Pop. 67,425.

Indra. Deity in ancient Hindu belief, representing the air or the heavens. At one time regarded as the chief of the gods, he has fallen into comparative unimportance. He is represented as a four-armed figure seated on an elephant, sometimes riding in a car. *See* Hinduism.

Indre. River of France. It rises on the slopes of the Auvergne plateau, and, flowing N.W., joins the Loire 13 m. W.S.W. of Tours. Its length is about 115 m., and it is navigable from Loches to the Loire, a distance of 45 m.

Indre. Dept. of France. In the centre of the country, it is mainly a plateau and an agricultural area watered by the Indre and the Creuse. Physically it is divided into three parts: the Boischaud, covering much of the dept.; the Champagne, a fertile region in the N.; and the Brenne, a marshy district in the W. Wheat, vines, and beet are grown, and sheep are reared. Indre is noted for its chestnuts and stone used for lithography. Châteauroux is the capital. Area 2,664 sq. m. Pop. 252,075.

Indre-et-Loire. A dept. of France. In the centre of the country, its area is 2,377 sq. m. It is in an area watered by the Loire, Indre, Cher, and Vienne, being divided into two parts by the Loire. The dept. is part of the central plain and contains the districts known as the Gâtine, the Véron, the Champeigne, and the Brenne. Although there is an infertile region in the N., most of the dept. is productive, especially along the valley of the Loire, and the vine is extensively grown.

Corn and fruit are other products. The chief town is Tours; others are Chinon, Amboise, and Loches. Before the Revolution the dept. formed most of Touraine. Pop. 349,685.

Inductance. A property of electric circuits. A varying magnetic field in one circuit induces e.m.f.s in all neighbouring circuits (by mutual induction) and also in its own circuit (by self-induction). The effect of self-inductance is like inertia of the circuit: when the e.m.f. is switched on in a circuit with considerable self-inductance, the current builds up slowly to its final steady value, and it dies out correspondingly slowly when the e.m.f. is switched off. Thus it affects electrical oscillations just as mass affects mechanical oscillations. The coefficient of self-inductance L measures this effect of a circuit on itself. The unit is the henry ($g.v.$). When the variation of the current is dI/dt amp per sec., the induced e.m.f. (in volts) is $V = L(dI/dt)$. The coefficient of mutual inductance M (in henries) is given by $V = M(dI/dt)$ where V is the voltage induced in a neighbouring circuit. The term inductance is also applied to coils wound specially for their inductive effect (more properly called inductors). They are used extensively in radio and electronic apparatus. Cores of magnetisable material increase their effect by increasing the magnetic fields produced.

Induction. Electrostatic induction (also called electrostatic influence) is the separation of positive and negative charges on conductors near a charged body. If, for instance, a positively charged, insulated metal sphere is brought near one end of an insulated metal rod, a negative charge will appear at the end of the rod nearest to the sphere, and an equal positive charge at the far end; vice versa for a negatively charged sphere. The closer the bodies approach, the more marked the effect. This principle underlies the action of such electrical apparatus as the electrophorus, the (gold leaf) electroscope, and the Wimshurst machine ($gq.v.$).

Electromagnetic induction is usually applied to the production of electromotive forces (and hence frequently of currents) in conductors by their motion relative to a magnetic field. The relative motion may be produced by physical movement of the conductors, magnets, etc., or by variation of current strengths. The faster the conductor cuts

through the magnetic field the greater is the induced voltage. The matter was investigated primarily by Faraday (his "anchor ring" experiment was one of many) but also by Lenz, Henry, Neumann, Kelvin, and others. Lenz's Law states that the induced e.m.f.s will be in the direction which tends to oppose (by means of the induced currents) the variation of current which gave rise to them. Faraday's (or Neumann's) Law states that the voltage induced in a circuit equals the rate of change of magnetic flux through the circuit. On electromagnetic induction depends the generation of electricity by dynamo (*see* Electromagnetic Machine).

Magnetic induction is the name sometimes used to denote one of the two vectors describing a magnetic field where a magnetic material is present. Usually (but not always) it is applied to the vector denoted by B .

Induction. Term in eccles. law for the ceremonial placing by the archdeacon of a clerk in holy orders in actual possession of a church or glebe; investiture of the temporal part of a benefice, as institution ($g.v.$) is of the spiritual. Induction consists in giving the clerk corporal possession of the church, as by holding the handle of the door or tolling the bell, the intention being to give all the parishioners due notice and sufficient certainty of their new minister to whom their tithes are to be paid. Not until a clerk has been formally presented, instituted, and inducted into a rectory is he in full and complete possession of the benefice and legally styled *persona impersonata* or parson impersonae.

Induction (Lat. *inductio*, bringing in). Mental operation by which it is inferred that what is known to be true in certain cases at certain times will be true in all cases at all times. This method of reasoning is based upon the principle of causality—that similar causes or conditions are always followed by similar effects. *See* Deduction; Logic.

Induction Coil. Electrical apparatus comprising two coils in which rapid variations of current in the primary circuit induce large e.m.f.s in the secondary. In the Ruhmkorff coil the primary, of fairly thick wire, is wound on an iron core, and outside this is wound the secondary, of many turns of fine wire carefully insulated. It uses direct current, and the rapid variations in the primary are produced mechanically by a

"buzzer," which works on the same principle as the electric bell (*see* Bells). A condenser is included across the contact points, the effect of which is to make the primary current decrease more rapidly than it builds up, and so produce a greater secondary voltage in one direction than the other.

Efficiency of the induction coil is improved by using stampings or parallel iron wires bound closely together instead of a solid iron core. When high voltages are required (say 50,000 volts or more), other types of interrupter must be used, e.g. the mercury jet. This comprises a motor-driven vertical hollow spindle with a hole in one side, and since it dips into mercury, the latter will be sucked up and projected through the hole by centrifugal force. The mercury jet impinges on a serrated metal ring which will serve to intercept and pass the jet continuously, so that several thousands of interruptions per second may be obtained. *See* Transformer.

Indulgence (Lat. *indulgere*, to grant, make a concession). As officially defined by the R.C. Church, a remission, granted by the Church, of the temporal punishment which often remains due to sin after its guilt has been forgiven. In the early days of the Church penitents were awarded severe public penances for their sins, especially apostasy, during the age of persecution. As a reward for the constancy shown by the faithful awaiting death in prison, the bishops, on the petition of these, sometimes granted remission of part of the penance to weaker brethren who were truly contrite. In time the indulgence was extended to the temporal punishment being suffered by souls in purgatory, and in the 14th century Pope Clement VI authorised the doctrine of the "treasury of merits," whereby the over-abundant merit of Christ and of the saints was deemed to have accumulated into a fund upon which the pope could draw for the relief of souls enduring punishment in this world or in purgatory.

Indulgences were either plenary, granted to persons absolved from all sin, or partial, granted to those who had the burden of no mortal sin upon their soul. Forgiveness of the sin was a necessary antecedent to the granting of either, which further was conditional upon the performance of acts of charity or the recital of prayers. But, however unexceptionable in its initial conception the system of indulgence may have been, it was

obviously liable sooner or later to misinterpretation and abuse.

The methods resorted to by Archbishop Albert of Mainz and Magdeburg, commissioner for Germany for the sale of indulgences authorised by Pope Leo X when rebuilding the church of S. Peter in Rome, and by the archbishop's sub-commissioner John Tetzel, amounted to a scandal which provoked from Martin Luther the 95 theses which he nailed to the door of the castle church of Wittenberg on the Eve of All Saints, 1517, and thereby launched the Reformation. The pope still grants indulgences, partial and plenary. *See* Reformation.

Indulgence, DECLARATION OF. Declaration of religious liberty issued by Charles II and James II. To afford relief to his R.C. subjects, James II, in April, 1687, issued without consent of parliament a declaration of indulgence, and a year later a second. These gave all his subjects complete religious liberty, thus setting aside the Test Act and the other measures passed after the Restoration which oppressed both Roman Catholics and Dissenters.

The declarations were never put into force, but by ordering all clergymen to read the second in their churches on two successive Sundays, James brought about the protest of the Seven Bishops, who were tried for publishing a seditious libel, but acquitted. In 1672 Charles II had issued a similar declaration of indulgence, but in 1673 at the desire of parliament he cancelled it. Both kings claimed a right to make the declaration by virtue of their prerogative, but almost unanimously the nation repudiated the claim as dangerous. *See* Prerogative.

Indulines. A group of blue, violet, and black aniline dyes. The first dyes of the series was made by Dale in 1863 by heating aniline hydrochloride with a solution of sodium nitrate. This colour was called azodiphenyl blue or induline, but similar dyes are also known as Coupier's blue, nigrosine, and violaniline. Induline is soluble in spirit and is used in calico printing and for the preparation of black spirit varnishes. *See* Dyes.

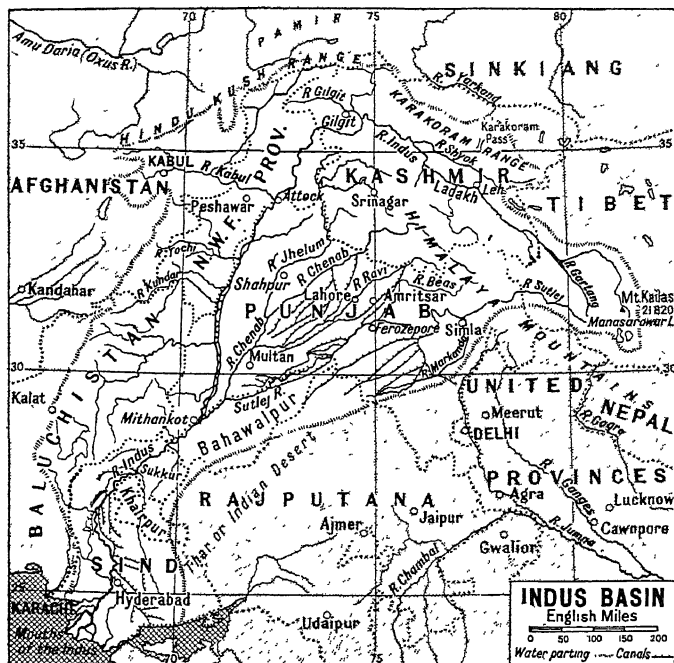
Indus OR THE INDIAN. Faint constellation of insignificant stars in the S. hemisphere, named by Bayer. It is near Sagittarius.

Indus (Sanskrit, *Sindhu*). River of Asia. It rises near the sources of three other great rivers—the Sutlej, Brahmaputra, and Ganges, on the N. slope of Mt. Kailas in

the Tibetan Himalayas, at an alt. of about 18,000 ft. Flowing N.W. through Ladakh, it bends S. about 20 m. S.E. of Gilgit, and then proceeds tortuously but generally in a S.W. direction to its delta in the Arabian sea. Its length is 1,800 m.; and drainage area 372,700 sq. m. It receives the Gartang 160 m. from its source and at Leh it is crossed by the trade route from India into Central Asia, via the Karakoram pass. Fed by the melting snows, it first flows impetuously through abysmal defiles in the Himalayas, then it emerges from the mountains and receives the Kabul river near Attock. Here, although at this point it has fallen some 16,000 ft., it is still a turbulent torrent. Near Mithankot it receives the Punjnad, which carries the accumulated waters of the five rivers of the Punjab, viz. the Sutlej, Beas, Ravi, Chenab, Jhelum.

The delta embraces 125 m. of coast, and covers about 3,000 sq. m. In its numerous arms the sandbanks are continually shifting, causing the channels to change their course, and the present chief estuary was only a minor channel in 1845. The tide is perceptible at 75 m. from its mouth. Hyderabad is the chief city on the banks, and the river is navigable to the neighbourhood of Attock, a distance of 900 m. Karachi, capital of Pakistan, stands at the extreme W. of the Indus delta. Fish are abundant, and otters, turtles, and the long-snouted alligator (gavial) are also found.

The Indus basin is notable for its scanty rainfall and high summer temperatures. During the monsoon, winds from the S.E. creep along the Himalayan slopes and bring a comparatively small rainfall to the Indus and its tributaries where they emerge from the foothills; S. and W. of this zone the rainfall rapidly decreases. The basin has four zones: the mountain section of glaciers and ravines where the rivers are torrential; the foothills section where the rains fall in the monsoon season; the upper plains with a slight monsoon followed by a dry season until the cold, rainy season from Jan. to March and the hot season from May to July; and the lower plains where the river flows across the edge of the Thar desert, a rainless region of great heat. Throughout the lowland parts of the basin the rainfall is inadequate or uncertain. The Lloyd barrage at Sukkur and a system of canals there—three on the right bank, four on the left—constitute the largest



Indus. Map of the basin of this North Indian river and its tributaries, which water an area of the Punjab notable for its scanty rainfall

irrigation scheme carried out by the British in India. Irrigation from these canals began in 1932. Canals have also been made to tap the torrential waters of the eastern tributaries and irrigate the upper plains, and to take off water from the lower river for the benefit of Sind (Pakistan). Most of the basin of the Indus lies in Pakistan, but the river also waters the state of Kashmir.

Industrial Council. Its working is described under Joint Industrial Council (*q.v.*).

Industrial Court. Board for settling trade disputes. In the United Kingdom these were established by the Industrial Courts Act, 1919. This provided that imminent disputes reported to the ministry of Labour should be referred for settlement to a standing industrial court consisting of representatives of employers and employed, together with some independent person. A permanent court was set up, its headquarters being 8, Old Palace Yard, S.W. See also Arbitration, Industrial; Docker; Labour Movement.

Industrial Design, COUNCIL OF. Body set up in 1944 by the president of the board of trade, to promote the improvement of design in the products of British industry. There is a separate Scottish committee. The council is financed by and responsible to

the government. Among its operations are the establishment of design centres in industries, supported on a cooperative basis with the help of a government grant; their functions include research, organization of exhibitions, and liaison with educational authorities. The word design is held to cover structure, texture, form, and decoration. The exhibition in London in 1946, entitled Britain Can Make It, was held by the council, whose address is Tilbury House, Petty France, London, S.W.1.

Industrial Diseases. In general, diseases which arise from and in the course of industrial processes. The term is applied to diseases specified in the various Workmen's Compensation Acts or the National Insurance (Industrial Injuries) Act, 1946. A person employed in certain industrial processes became entitled to workmen's compensation if incapacitated by specified diseases due to the nature of his employment. Under the Act of 1946 mentioned, an insured person in similar circumstances is entitled to benefit.

The Workmen's Compensation Acts named fewer than 50 industrial diseases. Among them were anthrax resulting from the handling of wool, hair, bristles, hides, and skins; lead, mercury, phosphorus, or arsenic poisoning re-

sulting from the use or handling of these substances; dermatitis; compressed air illness; cataract in glass workers or by exposure to rays from molten or red-hot metal; in miners, nystagmus, subcutaneous cellulitis of the hand, knee, or elbow; telegraphist's or writer's cramp; inflammation, ulceration, or malignant disease or anaemia of aplastic type due to X-rays or radio-active substances.

Since 1946 the minister of National Insurance may prescribe a disease as an industrial disease if he is satisfied that (1) it ought to be treated as a risk of the occupation and not as a risk common to all persons, and (2) the attribution of particular cases to the nature of the employment can be established or reasonably presumed.

Under the provisions of the Factory and Workshop Act, 1901, every medical practitioner attending on or called in to visit a patient whom he believes to be suffering from lead, phosphorus, arsenical, or mercurial poisoning, or anthrax contracted in any factory or workshop, must notify the same to the chief inspector of factories. See Workmen's Compensation.

Industrial Museum, THE. Permanent exhibition of methods, arrangements, and appliances for promoting the safety, health, and welfare of industrial workers. Founded in 1927, it is maintained by the Home office as the authority responsible for the safety of workers. With the object of standardising ideas for the prevention of industrial accidents, devices are exhibited showing how to render safe dangerous pieces of machinery. The museum is at 97, Horseferry Road, London, S.W.1.

Industrial Organizations, CONGRESS OF. This trade union movement of the U.S.A. is described under Congress of Industrial Organizations.

Industrial Psychology, NATIONAL INSTITUTE OF. Organization of psychologists specially trained to apply their science to increasing the efficiency of industrial and business concerns. The institute advises firms as to factory lay-out and systems of reducing waste of energy by operatives engaged in routine processes. It prepares intelligence and aptitude tests for the recruiting and training of employees for factories, offices, and shops. The offices are at Aldwych House, London, W.C.2.

Industrial Research. This subject is discussed under Scientific and Industrial Research, Department of (*q.v.*).

THE INDUSTRIAL REVOLUTION IN ENGLAND

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Further information will be found in the general article, United Kingdom, while Apprenticeship, Enclosures, and Guild are cognate subjects. See Smith, Adam, Wealth of Nations; and biographies of Hargreaves; Watt; Stephenson; and other inventors

The Industrial Revolution is the term used for the process which changed England from an agricultural to a manufacturing country. It belongs to the latter half of the 18th and the beginning of the 19th century. There had been a few notable inventions in the days of George II; but in the long reign of his successor, industry was so completely altered in character, and the daily life of the great masses of people so fundamentally changed, that the word "revolution," popularised by Arnold Toynbee in his study of the period, is now generally accepted.

About 1800 the hand spinning wheel, the hand loom, and the plough remained almost unchanged from very early days; but now the old machines were unequal to the demands made upon them. Everywhere in England was felt the spur to invention, the desire for better means of communication by land and water, the need for increased capital. The middleman had for some time had his settled place in English industry, supplying the raw material to the handicraftsman, and finding a wider market for the finished goods. At the same time the older economy had been giving way to the newer views of freedom in industry and commerce even before the publication of *The Wealth of Nations* in 1776.

Early Mechanical Inventions

The first great series of mechanical inventions began when Kay patented the flying shuttle in 1733. Hitherto the weft was passed through the warp by the weaver. It was now thrown across a much wider space by a mechanical device which greatly increased the weaver's power of work. It was in the cotton industry that the next improvements were made, the need being for an adequate supply of yarn.

In 1764 Hargreaves invented the spinning jenny, a hand power machine which could be worked easily by a child. In 1769 a new principle was introduced by Arkwright, who spun a finer and a stronger thread by using a system of rollers, revolving at different velocities and worked by water power. By the water frame pure cotton goods could at last be made with a strong cotton warp.

In 1779 Samuel Crompton combined the principles of both inventions in the mule, a hybrid machine which produced a still stronger

and finer cotton yarn—a muslin wheel, as it was sometimes called—that started a flourishing industry in which large fortunes were made. Though the hand spinners broke the frames, being afraid, and not without reason, that the new labour-saving machines would throw them out of employment, before Hargreaves died, in 1778, 80,000 jennies were being used in various parts of the country.

In 1785 Cartwright invented the first practical mechanical loom, and began the revolution in weaving. This was followed by his machine for wool-combing in 1789. It was not, however, till 1815 that the loom was perfected and came into general use. Improvements were now constantly being made in all the textile industries, and gradually the hand weaver disappeared as the hand spinner had done before him, unable to compete with the new machines.

The Supply of Power

But these new machines, practically all of English origin, called for a new power. Horse power was not unknown, but the hand or the foot of the worker was still the chief motive power. It was the use, first of water and then of steam, that made the revolution complete. Little sheds for the machines began to be built by waterfalls and rivers. The supply of water, however, was uncertain, and the ponderous steam-pump, which had long been used in the mines, was at last developed in 1766 into a practical engine to drive the machines of the spinners and weavers. James Watt saw how the up-and-down stroke of the piston could be best applied to the rotary motion of the wheel and axle. His steam engine was first used in the cotton mills, and soon in all the textile industries.

The development of England's vast mineral resources, checked in the 17th century by the lack of steam power, now proceeded apace. Abraham Darby had already discovered that iron could be smelted with coke, and the new era was ushered in by the use of Smeaton's blast furnace in the Carron Iron Works, 1760. This method was soon improved by the use of steam, and by Cort's invention, in S. Wales, of puddling, in 1783, and his use of rollers instead of sledge hammers in the making of iron bars in 1784. John Wilkinson, the first of the new ironmasters, was thought iron-

mad because he believed that iron could be used for building bridges, ships, and houses. An iron bridge, cast by Darby, was thrown over the Severn at Coalbrookdale in 1779, and Wilkinson launched an iron ship on the same river in 1790. There seemed no end to the uses to which iron and steel, first cast by Huntsman at Sheffield, could be put. Before the industrial revolution England hardly exported any iron; in 1815 it sent abroad more than 90,000 tons.

Shifting and Growing Population

It was natural that the new vast ironworks should be established in the coal districts. Everywhere industries were shifting to be near the sources of power, leaving the old half-agricultural centres of industry for Lancashire and Yorkshire, the Midlands and the north. At the same time the steady drift into the towns from all the countryside, noted almost from the days when town life first began, was now proceeding on so large a scale that soon the majority of men were leading an urban rather than a rural life. This was in itself a revolution.

But population was not only shifting; it was increasing by leaps and bounds. Since the cheapening of production created an ever-growing demand at home and in the new markets abroad, in the long run the demand for labour for men—and also for women and children, who could easily manage the light work of the new machines—increased so fast that all the old prudential checks to population, where they existed, were swept away. Wages might be low, but in large families there were many wage-earners to eke out the family income. In 1750 there were perhaps six million people in England and Wales, but in the second half of the century the population seems to have increased about 50 p.c. The first census was taken in 1801. In 1811 an increase of 14 p.c. of the population was shown, and of 21 p.c. in the next ten years.

The Country's Food Supply

The problem of feeding so large a population was a serious one, and before the end of the century it was becoming clear that the main supply would have to be imported from the new food-producing countries of the world. Side by side with the industrial changes another revolution had been taking place in agriculture. In 1760 about half the parishes in England were still in open fields. A new husbandry was soon to change the face of rural England. With the new grasses and winter feed roots a scientific rotation of crops was

at last possible, and the experiments of "Turnip Townshend," Coke of Norfolk, and Bakewell were copied all over the country. Lands were marled, manured, and drained. New implements and machines lessened the labour of man and beast. Arthur Young's constant testimony that "without enclosure there can be no good husbandry" led to innumerable private enclosure Acts before the general Act of 1801. Farmers could now do as they pleased with their land, and capitalists who invested in land made enormous profits. But the smaller cultivators, without ready money, were unable to compete with the great landowners, and the labourers especially suffered by loss of common rights.

The small farmers, who had been the backbone of England, gave up the struggle as hopeless, sold their farms, and found their way into the towns to try their fortunes, or sank into the position of agricultural labourers. Production was increased, and wealth accumulated in the hands of the few, but the "decay of men" of the lower class was a serious loss to the nation. Gangs of labourers worked the great estates, depending now almost wholly on wages.

Results of the Revolution

Early in the 19th century the industrial revolution was virtually complete. The economic structure of England was altered. Steam and machines had already driven out the old hand work in all the principal industries of the country. It was no longer scattered over the country nor carried on, for the most part, in the homes of the people. Masses of men, for the first time divorced from the soil, were crowded together in mean, monotonous streets, often without a yard of garden or allotments for their leisure time, or any of the old by-products of the home.

The great majority in town and country had become wholly dependent on wages earned in the service of others. More and more they tended to become mere "hands" in the gaunt, ill-built, ill-ventilated, insanitary, uninspected factories, to wait on the machines which seemed never at rest night and day. Industry was directed by the factory owner, who could afford the initial expense of buying and housing the machines, or could borrow perhaps from one of the new country banks. Custom based on reasonable ideas of welfare, which had once regulated all industries, gave way altogether to competition.

Government interference came to an end. Labour conditions were in a state of chaos, and no new legislation seemed possible as long as the theories of the ever-hardening science of political economy were accepted by men and masters alike.

Increased Wealth for the Country

The economic advantages of the change were many. Through the factory system came greater regularity of work, better organization, and far less waste of human effort. There was a great increase in speed and output. Trade, in which England kept the lead given her by her inventions, the command of the sea, and her supply of raw material, coal and iron at home and cotton from abroad, brought immense wealth into the country. Her teeming population enabled her to people the greater Britain which was being built up over the seas, and even the herding of men in great towns, in so far as it enabled them to cooperate for improving economic conditions, and for political action, was certainly not without its good side.

The many and obvious inequalities of the old political system could not, however, be hidden from men who realized that the new towns teeming with life and energy were unrepresented, while a "rotten borough" with few or no inhabitants might send two members to parliament. The Reform Bill of 1832, though it left working men still unenfranchised, was "a direct result of the changes of the time," and had far-reaching effects.

Bibliography. Introduction to English Economic History, W. J. Ashley, 3rd ed., 1894; English Economic History, selected documents, ed. Bland, Brown, and Tawney, 1920; Short History of the British Working Class Movement, G. D. H. Cole, 1927; The Industrial and Commercial Revolutions in Great Britain during the Nineteenth Century, L. Knowles, 1927; The Rise of Modern History, J. L. and B. Hammond, 1937.

Industrial School. Former name for state-aided or state-maintained institution for training children, principally those with criminal or other undesirable associations, now commonly known as approved schools. The idea originated in the work of John Pounds (1776-1839) for neglected and vagrant children, and that of the Ragged School Union. The industrial school expressed the newer conception that the law should seek rather to prevent and cure a tendency to wrongdoing than merely to punish the offender.

The Children's Act, 1908, drew a distinction between reformatories for actual offenders and industrial schools for the potential offender and very young children. The two types of institution have been merged in the Home Office approved schools. See Borstal; School.

Industrial Workers of the World.

International labour association, formed at Chicago in 1905. Regarding orthodox trade unionism as a failure, it holds that the expropriation of employers, and the seizure of all instruments of production by workers, can best be effected by the organization of labour in one great union, practising "direct action." Under William Haywood the association made progress in the U.S.A. among unskilled labourers, chiefly immigrants, and gained an unenviable reputation for violence, e.g. use of bombs. During the First Great War the leaders were suspected of accepting German money to foment industrial unrest, and Haywood was arrested.

The organization spread to Australia and New Zealand in 1909, and caused labour troubles in the 1920s, although outlawed by the Australian government in 1917. British branches were established quite early, but the members, chiefly drawn from the dock areas of London, Liverpool, and Glasgow, were not numerous. With the growth of the Communist movement, with which it quarrelled after the First Great War, the I.W.W. began to wane in the U.S.A. Its members there have long been known colloquially as "wobblies."

Indy, (PAUL MARIE THEODORE) VINCENT D' (1851-1931). French composer. Born in Paris, March 27, 1851, he studied at the conservatoire under Franck and became a pianist. An overture, *Piccolomini*, was written while he was a student; a rewritten version became the basis of an orchestral trilogy, *Wallenstein*, performed at Queen's Hall in 1909. The composer of several symphonies, e.g. that on a French mountaineer's song, for piano and orchestra, his most famous work was probably the music drama, *La Légende de S. Christophe*, 1920. D'Indy was director of the Schola Cantorum in Paris (founded 1894). He edited *Chansons Populaires du Vivarais*, 1900, and his biography of Franck, 1906, is a standard work. He died Dec. 3, 1931. *Pron.* Dandee.

INE OR **INI** (d. c. 730). King of Wessex. He became king in 688 and reigned until his abdication in 726. The chronicle tells of his wars against the Britons and the adjoining kingdoms of Kent, Sussex, and Mercia; in general these were successful, Kent, Essex, and London being brought under his rule. Civil strife drove him into retirement to Rome, where he probably died. Ine issued a code of laws, which is still extant.

Inebriate (Lat. *in, in; ebricare*, to make drunk). Legal term for an habitual drunkard. These are persons who by reason of habitual intemperate drinking of intoxicating liquors become at times dangerous to themselves, or incapable of managing their affairs, or a cause of harm or annoyance to others. Provision is made for them by the Habitual Drunkards Act, 1879, and the Inebriates Act, 1898. An habitual drunkard may voluntarily apply to enter a retreat licensed by the local authority. He may not leave until the expiry of the term in his application except on the order of a justice. If convicted of a serious offence caused by drunkenness he may be ordered to be detained, for not more than three years, in a state inebriate reformatory, or in a certified inebriate reformatory maintained by a local authority or privately. Convicted four times in a year of certain minor offences, he may be detained for not more than three years in a certified inebriate reformatory. His name must be placed on a black list, and if within three years he attempts to buy intoxicating liquor, he and any person knowingly supplying him may be fined.

Inertia (Lat. *idleness*). In mechanics, the tendency of a body to keep the motion it may have. It is more closely defined by Newton's first law of motion, that every body continues in its state of rest or of uniform motion in a straight line, except in so far as it is compelled by force to change that state. In considering the rotation of a body about an axis, an expression may be found which represents the sum of the products obtained by multiplying the mass of each small portion of the body by the square of its distance from the axis. This summation is called the moment of inertia of the body. The centre of inertia of a homogeneous body is the same as its centre of gravity or of mass. (See Centre of Gravity.)

Inertia in photography is the resistance of a sensitive emulsion

to light exposure. Actually it is the exposure value required to produce the faintest developable density (threshold), and is the indication of sensitivity.

Infallibility (late Lat. *infallibilis*, not liable to error). Doctrine that the Church is preserved from error by the guidance of the Holy Spirit when pronouncing authoritatively on matters of faith or morals. It is based on the promise of Christ that the Holy Spirit should guide the Church into all truth. Probably most Christians would hold that if the entire Church—including all denominations—were agreed upon any doctrine, the fulfilment of the promise of Christ might be confidently expected. But the final schism of the Eastern and Western Churches in 1054, and the later divisions brought about by the Reformation in the 16th century, put an end to the possibility of such united councils.

The Roman Church, claiming to be the one Catholic Church, regards her councils as the oecumenical councils of the Church and claims infallibility for their judgements, a claim rejected by all other sections of Christendom. The Eastern Churches make a similar but less pronounced claim for their greater councils; while the Anglican Church recognizes the authority of only the first seven general councils of the Church. Although the doctrine of the infallibility of the Catholic Church has not been solemnly defined, the Vatican council of 1870 did define the infallibility of the pope, claiming that he pre-eminently was preserved from error. Terms of the definition are as follows:

When the Roman pontiff speaks *ex cathedra* (that is, when using his office as pastor and teacher of all Christians, in virtue of his supreme apostolic authority, he defines a doctrine of faith and morals to be held by the whole Church), then, by the divine assistance promised to him in the person of Blessed Peter, he possesses that infallibility with which the Divine Redeemer was pleased to invest His Church in the definition of doctrine on faith and morals; and such definitions of the Roman pontiff are, of their very nature, irreformable, and not because of the consent of the Church.

According to Rome, this definition did not confer infallibility on the pope, but declares that all popes, from the earliest times, were so protected from error. Examples of the exercise of this power may therefore be quoted from papal documents before 1870, e.g. the letter of Leo to the

patriarch of Constantinople, 449, defining the doctrine of the incarnation of the Son of God; or the definition in the bull *Unam Sanctam*, 1302, of papal power by Boniface VIII; or of the Immaculate Conception (*q.v.*) by Pius IX in 1854.

Since it is agreed that the opinions of the pope as a private person are not protected from error, there may be room for discussion about the infallibility of some papal documents in which it is not clear that the pope was desirous of speaking *ex cathedra* in the sense defined by the Vatican council. See Church; Papacy; Vatican Council.

Infant (Lat. *in, not; fari, to speak*). Term used in English law for a minor, one who has not attained the age of 21. An infant is said to be "under disability." He cannot contract so as to bind himself, except for necessities, and the question what are necessities is partly one of fact and partly one of law. Food, drink, lodging, and raiment suitable to the infant's station in life are always necessities unless it can be shown that he is already well supplied with them. Contracts of apprenticeship, if they are fair, are binding upon an infant.

Under the Infants' Relief Act, 1874, all contracts by infants for money lent or for goods other than necessities, and all accounts stated with infants, are void. Certain contracts—e.g. tenancies, partnerships—made by an infant are binding on him unless he repudiates them within a reasonable time after becoming 21. A promise to marry made by an infant is not binding, nor does it become so by his mere ratification after attaining 21.

It is a misdemeanour to invite by letter, circular, etc., an infant to make bets or borrow money. An infant is liable for his torts (see Tort). He must always sue by some adult as his "next friend," and defend an action by his guardian *ad litem*. No infant, except a soldier, can make a valid will. He attains full age the day before his 21st birthday. See Children, Law About.

Infanta (Span. *child*). Title of the daughters of kings of Spain and Portugal. Infante was the title of the sons, except the eldest son of the king of Spain, who was styled prince of Asturias. The eldest son of the king of Portugal was called the prince of Brazil.

Infanticide (Lat. *infans*, infant; *caedere*, to kill). Murder of a young child. In the U.K. a woman who

causes the death of her child of under 12 months at a time when she has not fully recovered from the effect of the birth and when the balance of her mind is disturbed, is guilty of this crime under the Infanticide Act of 1938. The maximum punishment is penal servitude for life. Before 1922 there was no such crime as infanticide; a mother could be charged only with murder or manslaughter, and if convicted of murder would receive the death sentence, although it would certainly not be carried out.

In primitive communities infanticide is often conditioned by food-scarcity, whether on remote overcrowded islands as in Polynesia, or in mountain habitats as with the Todas. In some Australian tribes it furnishes a welcome food-supply in times of dearth. In India the girl-infanticide formerly prevalent, and mentioned by Strabo, was due to economic causes—among the Rajputs because of the cost of dowries. Boys were flung into the Ganges under religious sanctions. At the Indian census of 1911 it was estimated to be insignificant. Eugenic motives dictated the abandonment of feeble children in early Sparta.

Infantile Paralysis. Acute anterior poliomyelitis, a disease believed to be due to a filter-passing virus which infects the nervous system and acts primarily on the nerve cell, especially, perhaps, on those cells in the spinal cord which institute many bodily movements. It seems that the virus travels from the nasopharynx via the nerves of smell into the brain, and thence by nerve filaments into the spinal cord. This disease does not occur in infants, but is common at ages two to four. Cases are also frequent among young adults; less frequent in those of mature years. It is rarer among women than men. The disease is widespread over the world, both epidemic and endemic in its nature, and varies with latitude in its favourite months of attack.

Infantile paralysis is an instance of droplet infection, being passed on directly by the patient in the secretions of the nose and throat, and by carriers who, otherwise healthy, harbour the virus in the nasopharynx. The virus seems to cling to fruit, to be fly-borne, and to be passed with faeces. Two well-marked types of the disease co-exist, now one more prominent, now the other. One type, resembling a mild influenza,

must often pass unnoticed until some supervening paralysis calls attention to it. The other runs on for several weeks resembling a mild rheumatic fever, with headache, malaise, high temperature, and pain in the neck and shoulders. Again it is usually paralysis that makes accurate diagnosis possible.

Diagnosis and Treatment

Should the disease be suspected examination of the blood cerebral spinal fluid, and a routine investigation of the nervous system, allow it to be diagnosed early. But even then little can be done to prevent further development of the disease. Those physically over-fatigued seem most liable to contract the disease. Serum from convalescent patients has been used as a preventive treatment for contacts; an ordinary blood transfusion has proved even more useful. That a shortage of vitamins A and D seems to encourage poliomyelitis is supported by its prevalence in Malta during the Second Great War.

When pain and tenderness of the paralysed parts have subsided with rest and nursing, treatment consists in exercises, massage, and electrical stimulation. This must be kept up perhaps for two years. Where nerve cells are destroyed they cannot be regenerated, and other groups of cells and muscles may or may not be able to take on their work. The degree of initial paralysis is no guide to the completeness of recovery. Surgical measures may be helpful in achieving mechanical improvement. Death when it occurs is usually due to paralysis of the respiratory apparatus. If paralysis is not complete, recovery may be materially assisted by use of the iron lung (*q.v.*).

Infantile Scurvy OR BARLOW'S DISEASE. This is true scurvy (*q.v.*) modified by the youth of the patient. Caused by the absence from the diet of vitamin C, it may be seen equally among the children of the uninstructed, rich and poor alike, if fed on condensed and sterilised milks and patent foods with no fresh milk or fruit juice. The condition comes on gradually between the sixth and the eighteenth months of life.

While the child is left alone it is tolerably quiet, the lower limbs being kept drawn up and still; when moved it cries continuously and is clearly suffering pain in the lower limbs. Later, swellings may be detected on the limbs in the neighbourhood of the joints, and gradually the whole limb becomes

enlarged. The legs are now kept turned out and immobile, as if paralysed. Weakness of the back appears, and there may be swellings of the shoulder-blades and upper limbs. Creaking may be heard on moving the joints, and in severe cases separation occurs between the shafts and the ends of the long bones. The breast-bone presents an appearance as if it had sunk bodily back. Thickenings may occur on the skull. There may be a forward displacement of the eyeball, with puffiness of the lid. The gums are spongy and bleed easily. A lesser condition than this is more usually seen today.

Cure can be promised in about three weeks by the immediate inclusion in the child's food of 20 to 30 mgms. of vitamin C, with suitable quantities of orange or tomato juice and mashed potato.

Infant Mortality. Statistical term used for the death rate of children born alive and dying before the end of the first year of life. Stillbirths and miscarriages are not included in it. The rate is always given as "per 1,000 live births." For England and Wales it has been published annually by the registrar-general since 1838. In the early years of registration the figures fluctuated widely from year to year, reflecting the occurrence of epidemics and variations in social conditions. Decennial averages were:

Period	Deaths of Infants under 1 year per 1,000 live births
1841-1850	153
1851-1860	154
1861-1870	154
1871-1880	149
1881-1890	142
1891-1900	153
1901-1910	128
1911-1920	100
1921-1930	72
1931-1940	59

Figures for the period of the Second Great War were:

Period	Deaths of Infants under 1 year per 1,000 live births
1940	57
1941	60
1942	51
1943	49
1944	45
1945	46

The experience of other highly developed countries resembles that of England and Wales. In the U.S.A., for instance, infant mortality fell from 100 per 1,000 live births in 1915 to 38 in 1945. The figure for 1945 in certain smaller areas is still more striking—e.g. 28 in Rhode Island and Nebraska. (Compare this, however, with the 68 of Arizona and the 100 of New Mexico.) It should also be remembered that trustworthy statistics

are obtainable from just those communities which have low death rates.

Infant mortality in some large cities for 1946, compared with the rate in a pre-war year, was :

1946			
Oslo ..	22	25 (1935)	
Stockholm ..	22	35 (1935)	
Perth, W. Australia ..	25	39 (1937)	
Melbourne ..	27	44 (1935)	
New York City ..	28	48 (1940)	
Durban ..	29	59 (1936)	
Amsterdam ..	32	31 (1936)	
Toronto ..	32	51 (1931)	
Cape Town ..	34	47 (1936)	
Johannesburg ..	34	75 (1936)	
Copenhagen ..	41	50 (1935)	
Montreal ..	50	85 (1936)	
Paris ..	65	70 (1936)	
Bombay ..	195	247 (1931)	

The marked fall in infant mortality during the past 100 years, and especially during the twentieth century, cannot be ascribed to any one cause. It has kept fairly close step, everywhere, with the fall in the birth rate. But the relationship, if any, between the two is a subject of much dispute. Infant mortality has also moved in step with the fall in the general death rate and has accompanied the general rise in the standard of living—itsself probably not the least important factor: the improvements in public health, medicine, and midwifery; and, in recent years, the provision of organized pre-natal and post-natal care and the positive drive for maternal education. The importance of the last is shown by the much higher mortality among illegitimate infants — sometimes more than twice that of the legitimate. In the first decade (1911-20) that the distinction was made, for instance, the illegitimate rate in England and Wales was 194, as against 96 for the legitimate. In 1945 the figures were 65 against 44. In many cases, these deaths can be ascribed only to the mother.

Too much emphasis, however, can be placed on the environmental factors concerned. Constitutional —hereditary—factors are also potent in deciding who shall and who shall not live. This is well shown by the sex difference, the males having a weaker hold on life than the females. During the near-century 1838-1932 the average infant death rates in England and Wales were—males 146, females 119. The corresponding figures for 1945 are males 51, females 40.

Chief causes of deaths in the neo-natal period (first four weeks of life) are prematurity, injury at birth, asphyxia, and congenital malformation. The first named accounts for one quarter of all neo-natal deaths.

Infantry (Ital. *fantaria*, young footman). General term for a body of soldiers who fight on foot and are armed with weapons carried by themselves. It is one of the four basic branches into which a modern army is divided, the others being artillery, armour, and tactical aircraft. Despite constant changes in the art of warfare, infantry remains the decisive factor in any campaign. It is the oldest branch of the profession of arms.

Originally it was a nondescript and untrained rabble having neither coordination of weapons nor tactical direction. As the advantages of training and cohesiveness were realised by commanders, there emerged from the mass of undisciplined foot soldiers a select body with a recognizable tactical function. To this type belonged the Greek phalanx and the Roman cohort. These were infantry, fighting in close formation as tactical units, but co-existing with them were swarms of lightly armed foot soldiers of poorer military quality, whose function was to engage in preliminary skirmishing.

With the development of feudalism, the mounted knight rapidly replaced the infantryman as the main striking force. Except for a small corps of men-at-arms, infantry were simply the mass of feudal levies who could not provide themselves with horses. In the Italian principalities and city states, infantry were young footmen, who followed the mounted men to carry their spare armour and otherwise act as servants.

Effective in Holding Cavalry

Until the close of the 11th century, infantry were of little real influence in warfare; the cavalry charge decided battles, and the ill defended ranks were indiscriminately slaughtered. The battle of Hastings is a classic example. But in the 12th century new weapons, particularly the English long bow and the Genoese crossbow, and new tactical employment of pikemen gradually gave the infantry dominance on the battlefield. The schiltrion, or circle of pikemen, a defensive unit initiated by Wallace and used at Falkirk in 1298, gave the infantryman an effective method of holding a cavalry charge. The successful combination of the resistance of pikemen and the marksmanship of archers in opposing feudal cavalry was demonstrated at Courtrai in 1302, when the burghers of Bruges destroyed the knightly force led by Count Robert of Artois. Then followed the English archers' victory at

Crécy, after which infantry ceased to be an inefficient adjunct.

Defensive tactics were evolved to overcome the weight and momentum which previously had enabled a cavalry charge to sweep all before it. Infantry moved in dense masses; squares of pikemen, with archers in the centre, were practically unbreakable. About the beginning of the 15th century the long bow was replaced by the pike, while missile power was vested in the crossbow. Before firearms could make much impression, the pike prospered, and with it Spanish and Swiss troops, and later Cromwell's Ironsides, were the principal factors on European battlefields. The troops fought shoulder to shoulder in dense masses.

An Individual Combatant

During the Thirty Years' War, firearms became more powerful and easier to manipulate, and the infantryman was more of an individual combatant, requiring new discipline and tactical use. Gustavus Adolphus relied on a front six ranks deep instead of the massed square. The foremost rank consisted of pikemen to deal with cavalry assault, while the musketeers were in the rear, loading and firing in alternate ranks.

By the mid-18th century the pike was replaced by musket and bayonet. Then emerged the line, specially favoured by the British army. It gave a wide front and maximum fire power. Defensively, however, the square still proved most effective in containing a cavalry charge. Napoleon's method of pouring overwhelming artillery fire into the ranks of opposing infantry before launching his own infantry attack proved too costly in casualties when foot soldiers were in line. Fresh tactics again balanced the scales in the infantry's favour. Instead of waiting in line for the attack, the infantry dispersed and took cover from the artillery barrage; when the attackers followed up, the defenders held their fire until the enemy was at point-blank musket range, when a murderous volley was followed by a bayonet charge.

Throughout the latter half of the 19th century, the rapidity of fire made possible by the invention of the needle-gun necessitated the adoption of more extended order for infantry attack. In the Franco-Prussian War, the infantry advanced in open order, taking advantage of every piece of cover: only when close to the enemy did they rise to make the final assault.

The S. African and Russo-Japanese wars entailed only slight alterations in these tactics.

Further developments in infantry tactics were induced by the First Great War. Intense rapidity of fire was attained by the rifle and the machine-gun, while shells filled with shrapnel and high explosive were thrown great distances to disorganize the assembly of infantry in back areas. The soldier now required protection while waiting to attack and while moving forward. Artillery barrages, barbed wire, poison gas, tanks, and trenches were all designed to enable him to get into personal contact with the enemy or to prevent the enemy getting into contact with him. By 1915 fire power had reached such intensity that even when advancing in open formation infantry suffered enormous casualties; Passchendaele and the Somme were notorious examples, although faulty strategy and tactics were contributory factors. The tank and the creeping barrage did something in mitigation, but throughout the war infantry casualties were always disproportionately high.

The rapid development of the tank and the aeroplane between 1919 and 1939 inspired an entirely new conception. The use of infantry in the mass was abandoned, and the infantryman was trained to fight as an individual.

Cooperation with Armour

Through all the campaigns of the Second Great War, infantry worked in cooperation with armour; rarely did they assault a position without a preparatory attack by armour and artillery. Massed fire power from rifles gave place to the more destructive effect of light automatic weapons, while the rifleman himself was trained as a stalker and sniper. When advancing, individuals were well dispersed, so that at no time were there bunches of men to provide targets for the enemy; the general scheme was to infiltrate into a position rather than charge against it. That these tactics were sound was proved by the comparatively light infantry casualties suffered by the British and U.S. armies. The Russians and Germans, having almost unlimited man power, continued to believe in a modified form of the massed infantry attack, hoping to crush the enemy by sheer weight of numbers, and as a result suffered very heavy casualties.

In most modern armies the infantry tactical unit is the battalion, which, in the British service,

seldom exceeds 850 men. At the end of the Second Great War the administrative unit was the regiment, which, under the Cardwell system of 1881, has two battalions, with a territorial title. One battalion in peace time was always on foreign service; the other was at home completing the training of recruits. Each regiment had its own depot, where recruits received primary training and regimental records were kept.

After the war the reorganization of the army, which involved the inclusion of larger airborne and armoured formations, necessitated a reduction in the number of infantry battalions. The Cardwell system proved too rigid for adaptation to the new conditions, and in 1947 the British infantry establishment was completely remodelled. To achieve greater flexibility in the flow of reinforcements in wartime and to overcome the difficulties of drafting in time of peace, certain line regiments had their strength reduced to a small party of officers and other ranks. Each regiment retains a depot and incorporates a primary training centre. Men recruited for regular engagement in the infantry are trained at the depot, but conscripts receive primary training with the General Service Corps. Infantry are armed with rifles, bayonets, light and heavy machine-guns, grenades, mortars and anti-tank weapons. They no longer march long distances into action, but are carried there by brigade and divisional transport. See Army; Battalion; Brigade; Company; Division; Regiment.

David Le Roi

Infant School. Place for the instruction and training of children of tender years. In the U.K. the term has been applied to the department of the public elementary school concerned with children from 5 to 7 or 8 years of age, i.e. before their entry to the junior department. The infant school is therefore the place of the first stage of primary education, and corresponds roughly to the kindergarten, though large classes often make impossible the full adoption of kindergarten methods. The Education Act, 1944, gave the name nursery schools to schools for children between 2 and 5 years of age. In Great Britain the first infant school was founded by Robert Owen in New Lanark in 1800. See Education; Kindergarten.

Infarction (Lat. *infarcire*, to stuff in). Formation of a mass of degenerate tissue which follows

the blocking of a blood vessel by a solid substance, most frequently an embolism or thrombus. Such blocking may occur in any organ, but most often in the lungs, kidneys, or spleen, and if the artery blocked is large, serious results follow. When only a small vessel is blocked, other vessels in the neighbourhood take on the work of local circulation.

Infection (Lat. *inficere*, to put in, dip in, taint). Invasion of the tissues of the body by an organism which flourishes at the expense of the host. Bacteria and other infective micro-organisms may enter the body through the gastro intestinal tract, e.g. in typhoid and cholera; through the respiratory tract, as with pneumonia; or through the skin or a mucous membrane, e.g. in tetanus. In some diseases the infection is conveyed by some special agent, as malaria is by mosquitoes.

The bacteriologist Koch laid down conditions which must be fulfilled before a micro-organism found in association with a disease can be definitely regarded as the cause of that disease. These conditions are: (a) the organism must be constantly present in the organs or tissues of the person suffering from the disease; (b) it must be possible to isolate and cultivate the organism outside the body through several generations; (c) inoculation of the isolated and cultivated organism into a suitable animal should reproduce the disease; (d) the organism must be found in the animal thus infected.

Infection by a Micro-Organism

When infection by a micro-organism occurs, the bacilli, if relatively few in number, may be quickly overcome by the phagocytic action of the blood, and the infection rapidly brought to an end. If this does not occur, the micro-organisms increase rapidly. A localised infection affects only a limited amount of tissue, and does not extend to other parts of the body, e.g. a boil or an abscess. In a generalised infection the infective organism is conveyed by the blood or lymph channels throughout the body. Signs and symptoms of an infectious disease are due to the presence in the blood of poisonous substances or toxins generated by the micro-organisms. When an infection is localised, although the organisms do not enter the blood-stream, toxins may be absorbed from the tissues, producing symptoms of illness. This condition is known as toxæmia. See Notification.

Inferi. In Roman mythology, the gods of the lower world or abode of the dead, as opposed to *superi*, the gods of heaven.

Inferior Court. Term used in English law to describe certain courts of law which have a limited jurisdiction. Superior courts are the house of lords, judicial committee of the privy council, supreme court of judicature, court of criminal appeal, and courts of chancery of the counties palatine of Lancaster and Durham. All others—e.g. county courts—are inferior courts. The proceedings of an inferior court are under the control of the king's bench division. Whereas superior courts have jurisdiction throughout England and Wales, inferior courts have jurisdiction only over matters in a limited area. An inferior court attempting to exceed its jurisdiction may be prohibited from doing so by the king's bench division. See High Court; Petty Sessions; Quarter Sessions.

Inferiority Complex. Popular term for a mental state in which feelings of guilt and unworthiness affect personality and behaviour. These feelings may be rational, i.e. caused by serious wrongdoing; but they more frequently occur in persons of good character who attach exaggerated importance to childish misdemeanours. Parents are often to blame for asking the impossible of children, e.g. control of thoughts and feelings as well as of behaviour. In serious cases the guilt may be fantastic, based on unconscious fears of committing acts of which the sufferer is incapable. Inferiority complexes are commoner in women than in men, who tend to put blame for their own faults upon others. Treatment should induce the patient to see his behaviour at its real value and build up his self-respect.

Infidel (Lat. *infidelis*, faithless). Term applied by the professors of a faith, especially Christians and Mahomedans, to those who do not hold the same religious creed. In the English version of the Pauline epistles it is used in a negative sense, signifying merely a person who did not acknowledge the faith, not one who deliberately refused to believe or positively denied it.

Infiltration. Geological term for a process occurring in the crust of the earth whereby the tendency of fluids to spread under the combined influence of surface tension and gravitation causes changes in the rocks. Water containing substances in solution carries them into other parts of

the crust. Iron, silica, lime, and magnesia are introduced into rocks by this means.

Infiltration. In military tactics, the piercing of enemy lines at a number of different points by comparatively small bodies of troops, which join up behind the enemy positions and "pinch them out." The enemy is attacked at his weakest points, his defended localities being reduced later or left with no communications to the rear. The capture of the Malayan peninsula by the Japanese in 1941-42 was a notable example of infiltration on a small scale. The principle had larger application in the Russian drive W. from Stalingrad to Berlin, 1943-45.

Infinite (Lat. *in*, not; *finitus*, finite). That which cannot be measured or counted, to which nothing can be added and from which nothing can be taken away. Infinite is thus distinguished from both finite and indefinite. The finite undoubtedly has limits, whether known or not; the indefinite has or may have limits, which cannot be ascertained. As a noun, the Infinite is specially used to signify God, the Absolute Being. See God; Theism.

Infinite. In mathematics, a quantity greater than any assignable number, one to which known quantities may approach as closely as may be desired, but cannot attain. Consider the numbers $\frac{1}{5}, \frac{1}{10}, \frac{1}{20}, \frac{1}{40}, \frac{1}{80}, \frac{1}{160}, \dots$ etc. Their successive values are 2, 20, 200, 2,000, 20,000, etc. If the divisor were made infinitely small, the quotient would become infinitely large; as the divisor tends to zero, the quotient tends to infinity. The mathematical symbol for "tends to infinity" is $\rightarrow \infty$. One can conceive of numbers negatively infinite; thus $\frac{-1}{n} \rightarrow -\infty$

as the divisor n becomes infinitely small. The values of some quantities, such as the tangent of an angle, change suddenly from ∞ to $-\infty$.

Euclidean geometry assumes that lines and planes can extend to infinity, and parallel lines meet at infinity. Space may be considered infinite, though finite space must necessarily be conceived in any investigation. Time may be thought of as infinite in the same sense. An infinite series is considered to continue for ever; e.g. $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$ to an infinite number of terms. Such a series may have a limiting sum. In this example, the greater the

number of terms, the closer the sum approaches to the limit of 2. This fact is expressed by saying that the sum of an infinite number of terms is 2. See Series.

Infinitesimal. Term in mathematics denoting a quantity infinitely small, or an immeasurably small difference from a limiting value. Thus the number 0.9, that is, .999... continued indefinitely is infinitesimally less than unity, which is the limiting value of the sum. A quantity may be regarded as infinitesimal when so small relatively to other quantities that it is negligible; in astronomical calculations the radius of the earth may be treated as infinitesimal in comparison with the distance of most fixed stars. The notion of infinitesimals is fundamental to the differential and integral calculus, which are sometimes known together as the infinitesimal calculus.

Infinitive. In grammar, a mood of a verb. It has no tense or time significance and no persons or numbers. In English it is expressed by the preposition "to" being placed before the root of the verb, as in "to walk." The infinitive may be considered a verbal noun, used as either subject ("to walk is agreeable") or object ("I propose to walk"). A split infinitive, e.g. "I want you to generously give," is regarded as offensive by stylists.

Infirmity (Lat. *infirmus*, weak). Institution for the medical care of the sick or infirm. Essentially identical with a hospital, the term was applied more particularly to the medical department of rate-supported municipal institutions, such as unions and homes for poor persons. The special accommodation in public schools for resident pupils suffering from accident or illness is often termed the infirmary. An infirmary was an integral part of the old monastic establishments, and the monk or nun having charge of it was called the infirmarian. See Hospital.

Inflammation (Lat. *inflam-mare*, to set on fire). Natural reaction of living tissue to an injury. It is a protective process, which helps to prevent the effects of an injury from spreading and, where the tissues are not too badly injured, eventually brings about their repair. The most frequent cause of inflammation is infection of the tissues by micro-organisms, and after this, burns, blows, sprains, and irritating substances.

The first change in acute inflammation is a condition of hyper-

aemia, or increased supply of blood to the part, owing to dilatation of the small blood-vessels. The next change is exudation, the leucocytes or white blood corpuscles passing through the walls of the small vessels. In the surrounding tissue the leucocytes attack and destroy the invading micro-organism, many of them perishing themselves in the process, and forming the accumulation of white material known as pus. This process is known as phagocytosis (Gr. *phagein* to eat; *kytos*, cell), and is an important protection for the organism against attacks of disease from infection by micro-organisms.

Local Clinical Signs

Slight inflammation may terminate by complete recovery of the tissues. If, however, suppuration occurs, ulceration or necrosis of the tissues is likely to follow, permanent changes taking place and a scar being formed in the process of healing. The local clinical signs of inflammation are heat, redness, swelling, pain, and impairment of function. The relative extent to which the symptoms are manifested varies with the nature of the part involved; where dense, tough tissues are inflamed, such as those of the palm of the hand, there may be little swelling and much pain, though in adjacent parts, where the tissues are more lax, the swelling may be obvious and pain less. Pain may be felt, not only in the inflamed area, but in parts some distance from it, being transmitted by a nerve; e.g. pain from disease in the hip may be accompanied by pain in the knee.

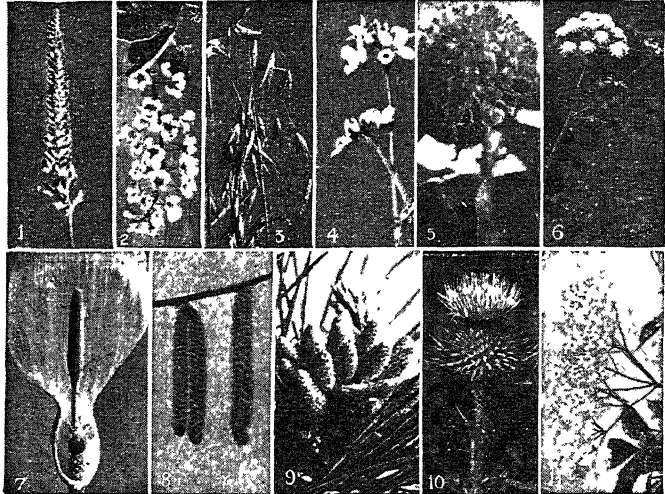
The management of inflammation consists in combating the essential cause. If micro-organisms are present they may be sensitive to penicillin or the sulpha group. Low grades of inflammation may be eased by mild exercise; acute inflammation demands complete rest. Local heat attracts fresh blood rich in unfatigued white cells to the inflamed area; or hygroscopic substances, such as glycerine, by withdrawing fluid can change the ingress of fluid to the parts, with similar result. Cold may shrink the vessels and check the inflammatory process.

Inflation (Lat. *inflare*, to blow in). Condition of being swollen with air and expanded like a pneumatic tire or toy balloon. The opposite is deflation. In economics inflationary tendencies are those which may cause a marked rise of prices. Inflation of currency occurs when government expenditure is financed

principally by loans instead of by taxes and much additional paper money is put into circulation. Prices then rise unless there is a commensurate increase in the quantity of consumers' goods, or complete price control and rationing, or a sufficient national abstinence from spending the additional money. Extreme inflation of prices may cause a community to lose faith in the currency, so that people revert to barter. Inflation benefits those

produce buds until the flowering season is over, whereas cymose inflorescence is terminated by a flower on whose stalk one, two, or more flowers arise as side branches, this process being repeated few or many times.

Racemose inflorescences are of several types. In the raceme proper the flowers are borne on stalks (lupin, bluebell). With the spike the flowers lack stalks and are tightly pressed against the stem (plantain). Catkins, such



Inflorescence. 1. Spike, plantain. 2. Raceme, snowdrop tree. 3. Panicle, oat. 4. Corymb, lady's-smock. 5. Umbel, ivy. 6. Compound umbel, water dropwort. 7. Spadix, cuckoo-pint. 8. Catkin, hazel. 9. Cone, Austrian pine. 10. Capitulum, spear plume thistle. 11. Cyme, elder

who have to pay money and impoverishes those entitled to receive fixed amounts (e.g. in payment for goods supplied, repayment of loans, interest, rent, pensions, salaries, and wages). See Credit; Prices.

Inflexion (Lat. *inflexio*, bending, modification). A change in the form of a word to denote its grammatical relation to other members of a sentence. In the noun such changes are called declension; in the verb, conjugation. The commonest instrument of inflexion is the suffix; some languages (Polynesian and Bantu) employ prefixes. See Grammar.

Inflorescence. Botanical term indicating either the manner in which flowers are borne on a plant or the actual structure thus formed. The simplest type is that in which the flower is borne singly at the end of a shoot, i.e. the flower is solitary (poppy, violet). Collections or so-called spikes of flowers may be divided into two main groups—racemose and cymose. In the former, the tip of the shoot continues to

as hazel, are pendent spikes. Racemes may be compound, and here the individual flowering stalks are replaced each by a miniature raceme, the whole inflorescence being termed a panicle. The simple raceme may have the flower stalks lengthened, so that the flowers are borne all at the same level in a corymb (candytuft). Or the stalks may vary in length but all spring from the tip of the main axis; this forms an umbel, which gives its name to the Umbelliferae. Finally we have the capitulum or head, which may be derived from a compressed umbel with flowers tightly packed together on a plate-like receptacle (sunflower.)

Influenza (late Lat. *influentia*, flowing in, influence). Highly infectious epidemic disease. It has been recognized since the 16th century, and widespread epidemics have sometimes affected a large part of the world. The so-called Spanish influenza of 1918 was prevalent all over Europe, the U.S.A., India, and Australia, the deaths in London alone averaging over 1,000

weekly. Like other infections, influenza is due to a micro-organism, but so far all isolated organisms have proved but secondary infections. One subdivision seems attributable to a virus. One attack predisposes to a second. Old and young alike fall victim.

The incubation period, between the entrance of the organism into the system and the beginning of the symptoms, is about 48 hours. High temperature, pain in the limbs, catarrh, and a prostration out of all proportion to the severity of the disease, characterise it. The type of the disease depends on the physiological system attacked. If the respiratory system is attacked, cough and a bronchial picture result; if the nervous system, depression and neurasthenic symptoms are present; if the circulatory system, a toxic heart muscle with irregular heart action may be found.

The general treatment for influenza is rest, warmth, and fluid. The special system struck by the disease determines the more specific treatment. Convalescence is nearly always long and tedious. Prophylactic measures consist in isolation of the patient, and in avoidance of droplet infection from the secretions of the nose and throat. But public health and medical controls appear to have little effect on an epidemic.

In forma pauperis (Lat. in the form of a pauper). English legal term. Anyone whose income does not exceed £4 a week and who is not worth more than £100 may, on showing reasonable grounds for taking or defending proceedings, obtain a certificate from the Law Society, entitling him to take or defend these proceedings without paying any fee or costs. This applies only to civil proceedings in the high court.

Information (Lat. *informare*, to outline). Term used in several senses in English law. Until recently the crown could take civil proceedings in the courts by a document called an information instead of by writ. The information was so called because in it the law officer "informed" the court of the facts on which the claim was based. Informations were of two kinds, Latin (originally written in that language), used to recover chattels or money claimed by the crown—e.g. income tax—and English, used for the recovery of land or rights over land. These methods were abolished by the Crown Proceedings Act, 1947. It is still possible for the crown to initiate

criminal proceedings by information instead of by the usual method of indictment, the information being filed *ex officio* by a law officer; but the device has not been used since 1887. In all these forms of procedure the crown enjoyed great advantages.

Criminal proceedings could once be initiated by information at the instance of a private person, but this procedure was abolished by the Administration of Justice (Miscellaneous Provisions) Act, 1938. The word information is still applied to the statement (usually in writing) made to magistrates regarding an offence alleged to have been committed and on which they issue a summons or a warrant.

Information, MINISTRY OF. Department of the British government charged with the distribution and control of news during the two Great Wars. In 1916 a department was set up under Sir Edward Carson to take over from the foreign office the tasks of disseminating information about the British effort in the First Great War and of counteracting enemy propaganda. The department was later divided into sections, Lord Northcliffe becoming director of propaganda in enemy countries. In 1918 it passed into a ministry under Lord Beaverbrook. A select committee on national expenditure criticised some of its earlier operations, and at the end of the year it was closed down.

At the outbreak of the Second Great War the ministry was reconstituted under Lord Macmillan. After public criticism of the slow release of news and the severity of censorship, Macmillan was replaced by Sir John (later Lord) Reith, who was in turn succeeded by A. Duff Cooper in the Churchill government. In July, 1941, Brendan Bracken became the fourth minister, and Geoffrey Lloyd took his place May–Aug., 1945. The last minister, Aug., 1945–March, 1946, was E. J. Williams.

The ministry worked in close conjunction with the services, advisers being appointed by the Admiralty, War office, and Air ministry. It disseminated such news and information as the govt. thought it advisable to release about the services, enemy action in the U.K. and at sea, the progress of the war, new weapons, etc. It also published books and pamphlets; some 23,000,000 copies having been sold in the U.K. alone by the end of 1944. A film division sponsored such pictures as Desert

Victory, In Which We Serve, and The Lion Has Wings; foreign versions were distributed all over the world. Departments were maintained in allied and neutral countries, and newspapers, magazines, and books were published in many languages. The B.B.C. was responsible throughout the war to the ministry, except for broadcasts to Europe.

The ministry ceased to exist on March 31, 1946. Instead a central information office was set up, with Robert Fraser as its first director-general. Among its functions were producing official films, carrying out government publicity campaigns, arranging exhibitions, providing by cable or radio a daily news service for overseas posts, and supervising the social survey. The responsible minister was the lord president of the council.

In the U.S.A. similar services were provided by the office of war information, set up on Jan. 13, 1942. This formed a department of the office of the assistant secretary of state. Its functions corresponded closely with those of the British ministry. The office was closed by President Truman on Aug. 13, 1945, but its overseas services were carried on temporarily. On Dec. 31 the office of information and cultural affairs (O.I.C.) was set up under the assistant secretary of state to disseminate abroad information concerning the U.S.A.

Informers. In English law, a person who makes an information before a magistrate as to some offence that has been committed. On this information criminal proceedings are started by the issue of a summons or warrant. The term is also used of a criminal who approves, i.e. comes forward to give evidence against his fellow criminals. In ancient Greece persons who laid information were called sycophants (*q.v.*); in Roman imperial times the professional *delator* or informer, who often acted on the suggestion of the emperor, carried on a lucrative business. See Common Informer; King's Evidence.

Infra - Phonic Vibrations. Sound oscillation that has too short a frequency to register any impression on the human ear. Infra-phonic vibrations are all in the high pitch or treble frequency; and those in excess of a wavelength of 1.7 cm. (0.67 in.) are generally inaudible to human beings. Many of particularly high pitch which fail to register on the human ear are perceptible by dogs

and bats. The bat can itself emit infra-sonic sounds inaudible to man, but upon striking any object they are reflected back and register on the animal's ear. This phenomenon, analogous to radar, enables the bat to avoid such obstacles as strings across its path while flying in the dark.

Infra-red Radiation. Term applied to light radiations of a wavelength longer than those of the visible range of the spectrum. In Angstrom units (\AA) they extend from 7,600 \AA , the limit of visible light at the red end of the spectrum, to $4 \times 10^6 \text{\AA}$ where they overlap with the short Hertzian waves. Their existence was discovered and demonstrated by Herschel in 1800. The emission of light is accompanied by the production of heat, the two phenomena being essentially the same. Infra-red radiations include rays which give the maximum sensation of heat, and the velocity of the propagation of this heat in a vacuum is identical with that of visible light, as rendered evident by the simultaneous "cutting off" of light and heat during solar eclipses. If a mass of material be heated to and maintained at 400°C. it will radiate heat, though not necessarily light; but infra-red rays obey the same laws of reflection, refraction, etc., as do ordinary light and can be focused with a concave mirror or through a lens.

Thermocouples and differential air thermometers demonstrate the existence of infra-red thermal radiation, but for more precise observations, bolometers, vane-radiometers, thermopiles, and radio balances are used. The refractive index of transparent materials is less for infra-red than for visible radiation. Ordinary glass transmits up to 3 microns, fluorite up to 9 microns, rock salt up to 15 microns; wavelengths up to about 5 microns are said to be in the near infra-red region.

Physical science uses infra-red radiation to elucidate molecular structure. This work is based on the fact that the spectra due to changes in vibrational energy levels and in rotational states of molecules lie in the infra-red range. Chemists use infra-red radiation in establishing the percentage of carbon dioxide in flue gases. Many factories have meters incorporating an infra-red ray device which gives visual warning when chimneys emit an excess of carbon dioxide.

Infra-red radiation has been applied to a camera device carried

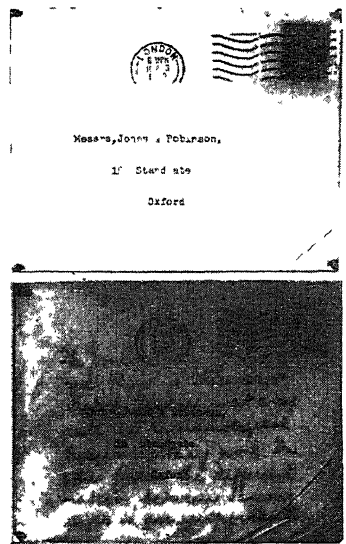
by ships to enable the navigators to detect obstacles in fog. The camera is fitted to the ship on a position giving unobstructed "vision," and by pressing a button a developed print can be obtained in less than a minute. The camera will photograph obscured objects up to a distance of 10 m.

During the Second Great War, infra-red radiation was developed as a military weapon. A sniper-scope enables a rifle or automatic gun to be sighted and fired against an invisible target. The infra-red light source is suspended under the gun barrel, so that the rays project wherever the weapon is pointed; when the target is picked up it sends radiations back to the gun, where they are focused by an objective lens in a telescope. The range of sight is approximately 500 yds.

Infra-red headlamps on tanks and other military vehicles driving in complete black-out clearly revealed the road ahead for 100 yds., and picked out all but the smallest objects at 200 yds. Lamps transmitting infra-red radiation beams are used for signalling; their flashes can be picked up only by receiving scopes sensitive to this radiation. Beacons and receivers on the same principle were fitted to night fighters of the R.A.F. in 1942 and proved invaluable in enabling aircraft to identify one another in defensive operations and when accompanying bomber formations at night.

Infra-red radiations are applied medically where it is desirable to raise the temperature of the surface tissue of the human body, as in rheumatism.

INFRA-RED PHOTOGRAPHY. Photographic plates may be made sensitive to infra-red rays by the use of suitable dyes. Such plates are still sensitive to blue and violet light, so must be used in cameras fitted with a filter which transmits only infra-red rays, or the light source may itself be filtered enabling photographs to be taken in visual darkness. Direct photographs may be taken of subjects illuminated with infra-red rays up to a wavelength of about 13,500 \AA and by indirect methods wavelengths of up to 20,000 \AA have been recorded. Infra-red rays are the least scattered or deflected by moisture or dust in the atmosphere and by haze; so by using cameras fitted with special filters and plates it is possible to record objects, even at great distances, normally invisible to the eye. This is made extensive use of in aerial survey



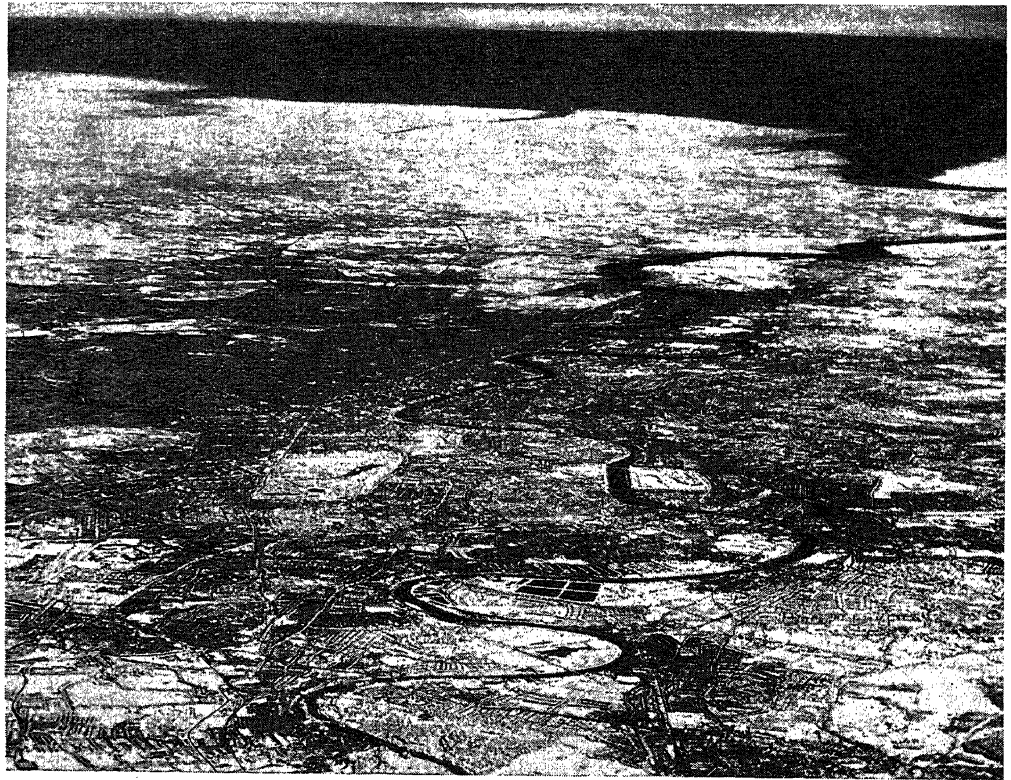
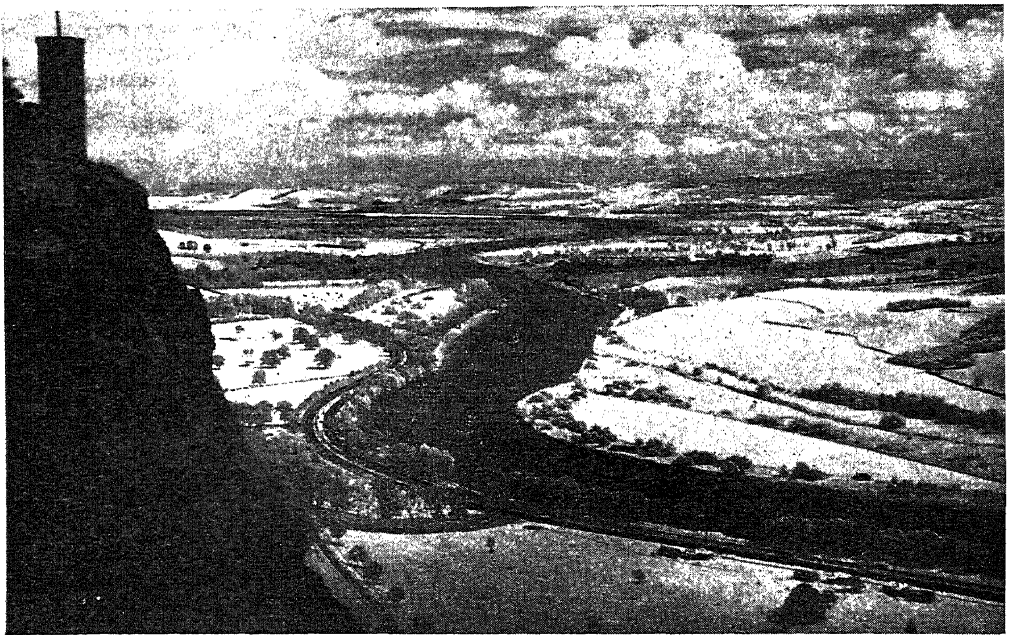
Infra-red Photography. Two photographs of the same envelope, the lower of which, taken on an infra-red plate (by reflected, not transmitted, light), reveals pencil writing on the enclosed sheet. See further illustrations, p. 4500

Photo, A. S. Quittenent, F.R.P.S.

work. Infra-red rays are absorbed or transmitted by, or reflected from, substances according to their chemical constitution without any relation to their visual colour; hence, when photographed by infra-red rays, noticeable differences arise between subjects which are visually alike. This property is exploited in qualitative analysis and in the differentiation of dyes and pigments, many of which are comparatively transparent to infra-red radiation, as also are thin sections of ebonite and many woods. Metals and carbon are impenetrable.

Infra-red photographs help in the detection of forgeries, alterations, and erasures, and in the deciphering of burned documents. Infra-red photographs are used in medicine to record shallow subcutaneous conditions, e.g. varicose veins not visible on the surface of the skin; and in photo-micrography this penetrative power is also used extensively in order to reveal details of internal structure in subjects which are otherwise opaque. See *Panchromatic Photography*. Consult *Photography by Infra-red*, W. Clark, 2nd ed., 1946.

Infundibulum. Part of the brain of a vertebrate. During development of the embryo, the floor of the large third ventricle of the brain pushes down a pocket. This is the infundibulum. It



Top: River Tay from Kinnoull Hill above Perth, winding through the Carse of Gowrie. The distance is approximately 25 m. The snow-like appearance of the fields is due to the reflection of the rays from chlorophyll (green colouring of vegetation), which is transparent to infra-red

rays. Lower: Forty-five miles across London from Kew Gardens to the Thames estuary and E. coast. Hyde Park, Battersea Park, Clapham Common, the Serpentine, the reservoirs at Barnes, and other landmarks can be easily discerned. See also Windermere, illus.; Wight, Isle of, illus.

INFRA-RED PHOTOGRAPHY: TWO EXAMPLES OF LONG-DISTANCE PHOTOGRAPHS

Photos: Donald Bradford and The Times

becomes closely applied to another structure, an up-pushing pocket of the mouth or buccal cavity. This is the hypophysis. Both the infundibulum and the hypophysis become secretory and form the composite organ of internal secretion, the pituitary body.

Inge, WILLIAM RALPH (b. 1860). British divine. Born June 6, 1860, at Crayke, Yorks, son of a future provost of Worcester College, Oxford, he was educated at Eton and King's College, Cambridge, of which he became fellow after a brilliant career. For four years he was a master at Eton, and during 1889-1904 fellow and tutor of Hertford College, Oxford. Inge came to London in 1905 as vicar of All Saints, Ennismore Gardens, but in 1907 returned to Cambridge as Lady Margaret professor of divinity, having been Bampton lecturer. During 1911-34 he was dean of St. Paul's Cathedral, where his utterances on public questions aroused much attention. Cutting across conventional opinions, his views on society, present and future, won for him the reputation of being a pessimist—the "gloomy dean." Essentially Hellenic in outlook, the leading authority on Plotinus and a critical student of Plato, sympathetic towards mysticism, the dean was an original, powerful, and honest thinker. His views are contained in *The Church and the Age*, 1912; *Outspoken Essays*, 1919; *Lay Thoughts of a Dean*, 1926; *Christian Ethics and Modern Problems*, 1930. His *Diary of a Dean* appeared 1949. *Pron.* Ing.



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Ingelow, JEAN (1820-97). British poet and novelist, born at Boston, Lincs, March 17, 1820.



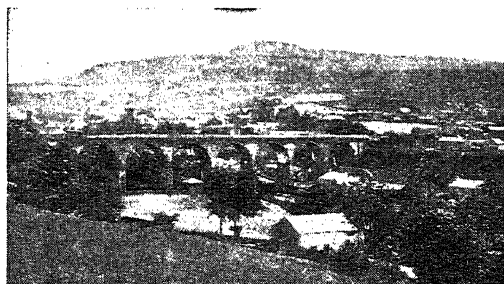
Jean Ingelow

The publication of a series of poems in 1863, containing the fine ballad *The High Tide on the Lincolnshire Coast*, first established her reputation, which was enhanced by *A Story of Doom*, 1867. She wrote stories for children, and novels, of which the best known is *Off the Skelligs*, 1872. She died at Kensington, July 20, 1897.

Ingersoll, RALPH McALLISTER (b. 1900). U.S. journalist. He was vice-president of the firm publishing *Time*, *Life*, and *Fortune*, 1935-40. Then he founded the *New York daily*, P.M. A private in the army in 1942, he rose to be staff colonel, serving under Gen. Devers, F.-M. Montgomery, and Gen. Bradley in the liberation of W. Europe. In a provocative book, *Top Secret*, 1946, he attacked Montgomery's generalship. He also wrote *Report On England*, 1940; *The Battle is the Pay Off*, 1943.

Ingersoll, ROBERT GREEN (1833-99). American politician and lecturer. Born at Dresden, N.Y., Aug. 11, 1833, son of a Congregational minister, he studied law, was admitted to the bar, and became attorney-general for Illinois in 1868. Developing remarkable power as an orator, he used this gift largely as an opponent of Christianity and the Bible. He spent a large part of his income in charity. His works include *The Gods and other Lectures*, 1876; *Some Mistakes of Moses*, 1879; *Great Speeches*, 1887. They were issued in 12 vols., 1900. Ingersoll died July 21, 1899.

Ingleborough. Mountain of the W. Riding of Yorkshire, England. In the Pennine range, the



Ingleborough. This peak of the Yorkshire Pennines, seen from across the village of Ingletton

peak is 8 m. N.N.W. of Settle and is 2,373 ft. high. On the summit are remains of a fort surrounded by a wall. It is best ascended from Clapham, where there is a rly. station (L.M. region). Ingleborough Cave consists of a series of passages in the limestone about 1,000 yards long, filled with stalactites, stalagmites, and other natural formations. On the lower slopes of Ingleborough is the pot-hole *Gaping Ghyll* (q.v.).

Inglis, ELSIE (1864-1917). A Scottish surgeon and Red Cross organizer. Daughter of an Indian civil servant, she was born Aug. 16, 1864, at Naini Tal in the United Provinces, and educated

at Edinburgh university. Shortly after the outbreak of the First Great War she gave up a flourishing practice in Edinburgh to inaugurate for war service the Scottish women's hospitals (q.v.), staffed entirely by women, and went in 1915 to Serbia. She and her fellow workers rendered incalculable service, not only among the wounded but during the devastating typhus epidemic. Taken prisoner when the Austro-German armies overran the country, she was later released, and in 1916 attached herself to the Southern Slav volunteer corps fighting with the Russians. With this unit she went through the Rumanian retreat. She died Nov. 26, 1917. *Consult* *Life*, Lady F. Balfour, 1918.

Ingoldsby Legends, THE. Fantastic stories in prose and verse, written by R. H. Barham (q.v.), under the pseudonym of Thomas Ingoldsby, and published 1837-47. The legends in verse are supremely good of their kind, the author's exuberance being wonderfully employed alike in tragedy and drollery. The metres are racy and the rhymes often novel and brilliant. The most widely known is *The Jackdaw of Rheims*.

Ingolstadt. Town and former fortress of Bavaria, Germany. It is 50 m. N.N.W. of Munich, on the left bank of the Danube, at an alt. of 1,200 ft. Founded as an estate of Charlemagne, endowed with urban rights in 1250, Ingolstadt was the residence of one of the Bavarian duchies from 1392 and the seat of a university from 1472 until it was transferred in 1800 to Landshut. It was a centre of the humanist school, and from 1549 the headquarters of the Jesuits in Bavaria. Ingolstadt had three huge gates of the old fortress; a palace of the 15th century, now an art gallery; the *Frauenkirche* (1425), and two Franciscan churches (13th and 17th century); and gabled private houses. Its industries were metal work, woodwork, and trading in grain and hops. Pop. (1935) 28,836.

Troops of the U.S. 3rd army fought their way into Ingolstadt with dive-bomber support on April 26, 1945, clearing it of German forces next day. It lay

in the U.S. zone of occupation after the Second Great War.

Ingot (A.S. *in*, in : *goten*, poured). Mass of metal cast in a mould to a suitable size, weight, and shape for subsequent treatment. Ingot steel is a convenient block form in which steel from a converter is cast preparatory to subsequent working, such as rolling. See Casting; Steel.

Ingraining. Art of dyeing with fast colours. The word grain was once used for kermes and cochineal insects (*q.v.*), from which scarlet dyes were originally derived. Substances that are ingrained are dyed with fast colours, *i.e.* they are dyed in such a way that the colour penetrates the actual fibres of the material. Ingrain colours are formed either by the union of a dyestuff in the fibre with a mordant or by the decomposing of a soluble compound into an insoluble one in the fibres. Ingrain carpets are those which have been treated by one of these processes, the wool or worsted used having been dyed in the grain before manufacture. See Dyes.

Ingram, HERBERT (1811-60). A British journalist. Born at Boston, Lincs, May 27, 1811, and



Herbert Ingram,
British journalist

started *The Illustrated London News* (*q.v.*), May 14, 1842. He was M.P. for Boston, 1856 to Sept. 8, 1860, when he was drowned with his son Hugh in the wreck of the *Lady Elgin* steamer on Lake Michigan. His body was recovered and buried in Boston, where a statue was erected in 1862.

Ingram, JOHN KELLS (1823-1907). An Irish economist. Born in co. Donegal, July 7, 1823, he was educated at Newry and Trinity College, Dublin, where he obtained a fellowship and in 1852 became professor of oratory and English literature. In 1866 he exchanged his chair for that of regius professor of Greek. Although a fine classical scholar, a talented mathematician, and a sound philosopher, it was as an economist that Ingram won European fame. His *History of Political Economy*, 1888, and *History of Slavery*, 1895, are his

most memorable works. Librarian and later vice-provost of Trinity, he died May 1, 1907. He wrote the poem, *Who fears to speak of '98?*

Ingram, REX (b. 1892). Irish-American film director. Born in Dublin, he was educated at Trinity College there and emigrated to the U.S.A. in 1911. After a brief stage career he wrote scenarios for Fox film productions. As a director he made his name with the ambitious *Four Horsemen of the Apocalypse* shortly after the First Great War. During the 1920s he directed *The Prisoner of Zenda*, *Mare Nostrum*, *The Garden of Allah*; and in 1940 *The Thief of Bagdad*. He is not to be confused with Rex Ingram, a negro actor who made his name in the film *Green Pastures*.

Ingres, JEAN AUGUSTE DOMINIQUE (1780-1867). A French classic painter. Born at Montauban, Aug. 29,

1780, he was the son of a versatile exponent of many arts. After studying painting at Toulouse, young Ingres entered David's atelier in Paris in 1796. He showed marked proficiency in the academic style, and when, in 1806, he proceeded to Rome, where he resided until 1820, he devoted himself to an exhaustive study of Raphael and the Old Masters. He then lived for some years in Florence. He remained a pronounced uncompromising adherent of the classical school all his life. His drawing, usually unimpeachable, was often superb in its combination of strength and suavity, but his colouring was thin and cold. Recognition came only slowly, but by 1825 his reputation was firmly established in Paris, where he was able to open a school. He succeeded Vernet in the directorate of the French School in Rome in 1834, remaining there until 1841, and was named a senator in 1862. He died in Paris, Jan. 14, 1867, leaving over 3,000 drawings and many paintings to the town of Montauban. His most famous works include *Oedipus* and the Sphinx, 1808; *An Odalisque*, 1819; *Jesus Giving the Keys to S. Peter*, 1820; *The Apotheosis of Homer*, 1827; *Joan of Arc*, 1854; and, best known of all, *La Source*, 1856, now in the Louvre and one of the most perfect repre-



J. A. D. Ingres,
French painter
Self-portrait

sentations of the nude human figure ever painted. His portraits are distinguished as much by harmonious composition as by their fidelity to character.

Inhabited House Duty. Tax levied by the British government on dwelling houses of all kinds if worth £30 a year and over. It was introduced in 1851 and repealed in 1924.

Inhambane. Coastal dist. and town of Mozambique, Africa. It is fertile and contains good agricultural land, but numbers of natives emigrate for a period to the Transvaal mines, where they form a considerable proportion of the workers. Its area is about 33,000 sq. m. and the pop. perhaps 750,000. The port of Inhambane, capital of the district, is situated between Lorenzo Marques and Beira, and possesses a spacious harbour. One of the oldest Portuguese settlements on this coast, Inhambane is the terminus of a coastal rly, which is being constructed from Lorenzo Marques, and is connected by rly. with Chai-Chai on the Limpopo river. Pop. 20,000.

Inheritance (Lat. *in*, in; *heres*, heir). In English law, before 1926 the rules of inheritance determined who was the heir of a person who died intestate, the heir being entitled to the real property of the deceased. Since 1925, both real and personal property pass to the next-of-kin of the deceased. See Hereditament; Primogeniture.

Inhibition (Lat. *inhibere*, to hold in). Term used in psychology to indicate that some activity of body or mind is paralysed or hindered in its functioning. The extreme case is paralysis resulting from hysteria. A common example from daily life is the symptom of shyness. The root cause of inhibitions is unconscious fear, derived from feelings of guilt, though conscious anxiety is often present. Inhibitions may be particular, as when we "cannot bring ourselves" to perform some task like writing letters. Inhibited types are afraid of taking risks, since they feel unconsciously that they deserve to fail; of human contacts, since they doubt their power to control hostile or sexual impulses; of accepting responsibility, since it would increase the burden of anxiety. Cure may be effected by tracing to its origin, and uncovering, the unconscious cause of fear.

Inhibition (Lat. *inhibere*, to hold in). Term used in English ecclesiastical law. It is a command

from a bishop to a clergyman in his diocese, prohibiting him from performing any clerical function. See Ecclesiastical Law.

Inishmore. Largest island of the Aran group, Eire. Situated 30 m. S.W. of Galway, it is 9 m. long by 2 m. broad; the inhabitants are employed mainly in fishing. See Aran Islands.

Initial (Lat. *initialis*, adj. beginning). In printing, a large letter placed at the beginning of an article in a newspaper or periodical, or of a chapter in a book. At one time spaces were left to be filled in by blocks of an ornamental character, a practice adapted from old missals and other illustrated MSS. Modern custom favours the use of a letter, called a 2-line letter, double the size of the type in which the body of the text is set up.

In its plural form, initials, the word means the first letters of a person's name, often written or printed in place of the full signature. In English law they are generally as valid as a full signature. Under the Statute of Frauds and the Sale of Goods Act, where contracts in writing, and signed, are required in certain cases, it has been held that initials, or even a billhead with the name of the contracting party printed at the top, constitute a sufficient signature. When a party to a legal instrument makes a cancellation or alteration or interlineation, he should write his initials near it.

Initial Velocity. Speed of a projectile through the air at the instant its base leaves the muzzle of a firearm. It is the maximum velocity of the projectile during its flight; thereafter velocity drops the farther the projectile travels and, provided it does not strike any obstacle in its path, it will fall to the ground. The initial velocity of a .303 rifle bullet is 2,400 ft. per sec., but with special streamlined bullets it is increased by 450 ft. per sec. Initial velocity of artillery projectiles is generally higher than that of a rifle bullet and depends upon the calibre of the gun and the weight of the charge. See Ballistics; Velocity.

Initiation (Lat. *initium*, beginning). Term signifying introduction into a society, business, or office. It is more particularly used of admittance to a secret organization, and is accompanied by certain rites and ceremonies. In primitive culture these rites concern especially ceremonial introduction into the privileges and duties of adult life, and represent the higher education of civilized society.

Before, at, or after puberty the novices pass through a preparatory course, lasting for weeks or even years. Isolated from their families and the other sex, they may undergo physical mutilation, e.g. circumcision, tattooing, and tooth-chipping.

The final mysteries are usually unfolded in a magico-religious atmosphere designed to arouse awe, enhanced by such mystic devices as bull-roarers and sacred masks. The formal initiation may comprise simulation of death and resurrection, acquisition of a new name, vesture, and ornaments, explanation of sacred objects, rehearsal of tribal lore by pantomime or earth-images, and, above all, directions regarding married life, social intercourse, etc.

Initiative. In politics, the power of originating legislation. In the U.K. the initiative in regard to bills of a financial nature is with the house of commons, and the initiative on all important legislation rests in practice with the government. Some political reformers are in favour of an extension of initiative to the people, something on the Swiss model. In Switzerland if 30,000 citizens present a petition for the revision or annulment of a measure passed by the legislature, it must be submitted to a referendum. The same course must be taken if the demand is made by eight cantons.

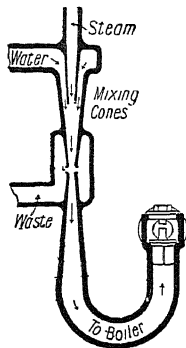
In military strategy and tactics, an army is said to hold the initiative when it is in the position to force upon the opposing side its own choice of time, place, and conditions of battle.

Injection (Lat. *injectio*, throwing in). In medicine, a general term for introducing from without a substance into an organ or tissue. An injection may be made into the rectum—enema—for the purpose of supplying food material (nutrient enema) or fluid, when the normal function of the upper gut is cut off, or for softening a faecal mass. Hypodermic injections are solutions of drugs introduced by a hypodermic syringe and needle under the skin into a muscle or a vein. They are used in varying conditions where absorption from the intestinal tract is uncertain, or where quick result, or prolonged activity of the drug, is necessary.

Injector. Device in which the velocity of high pressure steam or compressed air is used to move fluids or gases through pipes or other channels. If the apparatus be designed primarily as a feeder, it is termed an injector; if as a

remover, an ejector. The principle is the same in both.

The diagram shows an injector to force water into a steam boiler. Steam is admitted through a jet into a conical chamber, which has connexion, through a pipe with a water supply. At first the steam escapes through the overflow expelling air from the conical chamber. The vacuum set up causes water to enter the chamber, where it is caught up by the steam—



Injector. Diagram illustrating principle of working. See text

which it condenses—and carried at high velocity into a cone having at the bottom a non-return valve. The expansion of the cone towards the valve converts the momentum of the water into pressure sufficient to open the valve and deliver the water to the boiler, whence the steam comes.

An injector is usually so constructed that the distance between the two cones can be adjusted by moving one cone, to alter the area of the annular space between them and facilitate starting up and economical working. In the vacuum brake systems used on steam rly. locomotives an injector (or ejector) of similar type exhausts the air from the train brake pipeline. See Brake; Steam Engine.

Injunction (Lat. *injungere*, to bid, enjoin). A term of English law. It means an order of the court prohibiting a defendant from doing something which he has started to do, or threatens to do. At common law this remedy did not exist; but it was invented by the court of chancery, the common law remedy of damages being often inadequate. As a rule, injunctions are negative: they are commands to refrain from doing something; but in rare cases the court will grant a mandatory injunction, commanding something to be done. A plaintiff who issues his writ can, as a rule, on showing that the defendant threatens or intends to do something which would injure him, obtain an interlocutory injunction at once, to restrain the mischief until the trial of the action. In the case of libel, however, the court will hardly ever grant an interlocutory injunction.

INK AND INK MANUFACTURE

C. Ainsworth Mitchell, D Sc., former Editor of *The Analyst*

This article gives an account of the various kinds of ink. See Gall Wasp; Tannin; also Printing; Typewriting; Writing

Ink (Lat. *encaustum*) is a liquid medium by means of which more or less permanent characters may be produced upon any material. The principal kinds are (1) writing; (2) copying; (3) drawing; (4) marking; (5) printing; (6) typewriter; and (7) inks for special purposes.

WRITING INKS. The earliest writing inks consisted of a mixture of lampblack with a solution of glue or gum. Such inks are still used in China, Egypt, and the East, but have long been replaced in Europe by inks made from iron and galls. This transition from carbon inks of the Eastern type into the modern inks took place very gradually and was not complete until the 14th century or later. When such materials as crushed galls, myrobalans, divi-divi, or chestnut bark are soaked in water they yield a solution of tannin, and this has the property of combining with iron to form a tannate of iron, which darkens on exposure to the air and forms another tannate of iron which is nearly black and does not dissolve in water. Galls produced by the gall wasp or other insect are the principal source of tannin for ink.

The iron salt most commonly used by ink manufacturers is iron sulphate or copperas, and it is essential to the manufacture of a good and stable ink that the correct proportions of these ingredients be used. Naturally, this varies with the composition of the tannin material, but, speaking generally, the proportions that have been found to give the best results are one of copperas to three of galls. If too little iron be present, the writing fades. An ink to be reasonably permanent should contain not less than 0.2 per cent. of iron, while for a standard documentary ink at least 0.5 per cent. of iron should be present. The iron tannate is the main constituent of iron gall ink, but as such a solution by itself is unstable, a small proportion (about 0.1 per cent.) of an acid is added to prevent the ink from changing in the bottle. The ink is then left to mature for a month or more in the ink vats.

In the older types of inks the preparation was exposed to the air before bottling to make it dark, but in the modern blue-black inks a provisional colour such as indigo or aniline blue is introduced to give colour to the writing pending the formation of the true ink pigment of iron tannate. A small amount

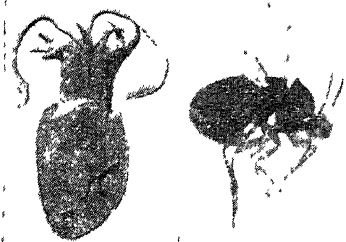
of carbolic acid is generally added to prevent mould, and in some inks a little gum is used. Acid-free inks are made from gallic acid, which is separated from the galls. The compound of iron and gallic acid can be made stable in solution without adding mineral acid.

The colouring matter of logwood, haematoxylin, combines with salts of metals, notably potassium chromate, to form an ink, but such inks lack the permanency of iron gall inks and are chiefly employed in schools, where a cheap ink is the first consideration. Aniline inks consist mainly of solutions of aniline dyes, and a preservative, sometimes having the addition of a small amount of gum. Red ink, for example, is usually a solution of eosin (*q.v.*).

COPYING INKS. Any ordinary iron gall ink will yield a copy for some time after writing, but in order to get better results, a larger proportion of copperas, galls, and dye is used, together with a small amount of a substance, such as glycerin, to prevent too rapid drying of the ink.

DRAWING INKS. These include sepia, extracted from the dried ink-sac of the cuttle fish, *Sepia officinalis*; Indian ink, composed mainly of fine lampblack and glue; and the so-called "waterproof ink," which consists of a pigment or colouring matter suspended in a liquid medium such as a solution of shellac.

MARKING INKS. Various plants produce juices which form a permanent stain on exposure to the air. One of the best known of these is the Indian marking nut, *Semecarpus anacardium*, the brown juice of which turns black on contact with lime or an alkali, and is used in the U.S.A. as the basis of a



Ink. 1. Ink-makers mixing glue and lampblack (from a Chinese print). Natural sources of the tannin used in ink are shown—whole and in section—in 2 and 3. Aleppo gall, produced by the gall fly or wasp (6); also in 4, myrobalans, dried East Indian astringent fruits resembling the prune. The dried sac of the cuttle fish, 5, yields sepia used in drawing ink, and from the Indian nut, *Semecarpus anacardium*, 7, is derived a juice forming the basis of a marking ink

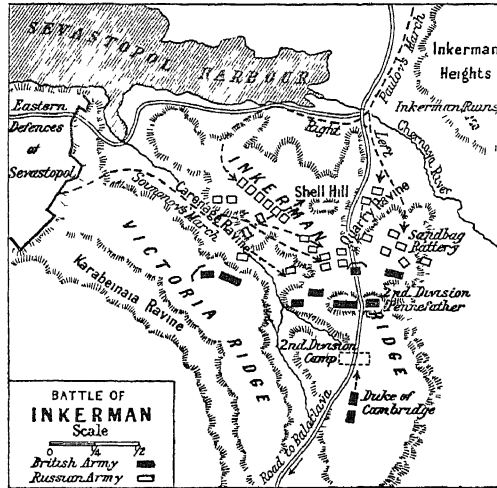
marking ink. The best known chemical marking inks are preparations of silver salts, such as silver tartrate, which become black on exposure to light, the process being accelerated by the application of heat. More recent preparations consist of solutions of aniline salts, which, when treated with an oxidising agent, *e.g.* sodium chlorate, in presence of a metallic salt, *e.g.* copper chloride, yield an insoluble deposit of aniline black. These two portions of the ink are usually kept separate until just before use, but "one-solution" aniline inks may also be obtained.

PRINTING INKS. These are composed of a fine pigment, such as lampblack, gas black, ultramarine or Prussian blue, incorporated with a liquid drying medium such as boiled linseed oil, with the addition of various ingredients such as soap, resins, etc. Essentially, printing inks are a special kind of oil paint.

TYPEWRITER INKS frequently consist of a solution of methyl violet with a suitable thickening agent, such as glycerine or oil. The black inks contain an aniline dye, such as nigrosine, or a finely divided carbon pigment.

INKS FOR SPECIAL PURPOSES. These include cancelling inks, which are essentially dilute printing inks; cheque inks, containing ingredients to prevent forgery; stamping inks, usually special solutions of aniline dyes, which dry rapidly; and inks of special composition for writing upon glass, wood, metal, leather, and the like. To this class also belong inks for secret writing, which became important during the First Great War. Most consist of a colourless liquid, *e.g.* a solution of gallic acid, which forms a coloured compound, *i.e.* an ink, on treatment with the solution of a substance such as copperas. Others are composed of the juices of plants, *e.g.* lemon juice, which darken on paper when heated.

TESTING INKS. Chemical tests show the approximate age of inks.



Inkerman. Plan of the battlefield showing the disposition of the forces and the lines of the Russian attack

Modern blue-black inks may be distinguished from old iron gall inks by treatment with oxalic or acetic acid. Iron gall inks can be distinguished from those in use during the early Christian era, since the basis of all ancient inks was a form of carbon, by the application of a dilute bleaching agent.

Inkerman, BATTLE OF. Fought during the Crimean War between

promptitude of Pennefather, the general commanding the 2nd division, threw their plan out of gear, and after a confused fight between the infantry the Russians fell back, their general having been killed.

Another large Russian force had by now arrived and delivered another attack. This centred round a small battery, known as Sandbag battery, which a few British defended desperately against assault after assault. Reinforcements, British and French, soon arrived, and there were a number of small counter-attacks. Eventually the guns planted by the Russians on Shell Hill were silenced. The British lost about 2,400 out of 8,500 engaged; the French lost over 900. The Russian losses were placed at 11,000 or 12,000 out of 42,000 engaged. The fight lasted about seven hours. *See* Balaclava; Crimean War

Inkhorn. Small portable receptacle, made of horn, wood, or metal, for holding ink and sometimes writing instruments. At one time they were in common use in Europe, and are still used in parts of the East.

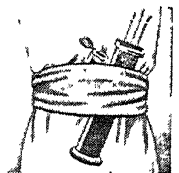
Inkpen. Village of Berkshire, England. It is 4 m. S.E. of Hungerford and near it are Inkpen Beacon, 960 ft., and Walbury Camp, 975 ft., culminating heights of the chalk that runs through Berks, Hants, and Wilts, and the highest chalk downs in England.

Inland Revenue. Name given in the United Kingdom to certain items of the national revenue. It



Inkerman. Clift with ruins of Genoese fortifications. Top right, convent built in the cliff

the British and the Russians, Nov. 5, 1854. Inkerman Ridge, overlooking Sevastopol, was held by the British during the siege of that fortress, and here the Russians attacked them on Oct. 25, but were repulsed without difficulty.



Inkhorn carried by Eastern scribes

includes income tax, the various death duties, and stamp duties, but excludes the revenues from customs and excise. The collection of inland revenue duties is supervised by the board of inland revenue (v.i.).

Inland Revenue, BOARD OF. Body responsible for collecting a great part of the national revenue of the U.K. Originally, in 1694, commissioners of stamps were appointed, and a little later commissioners of taxes; in 1834 a board of stamps and taxes was established. In 1849 the board was amalgamated with the commissioners of excise and given its present name, which it retained after 1909 when the task of collecting the excise duties, performed by it for 60 years, was transferred from it to the board of customs. The board has a chairman and other commissioners, and is responsible for collecting the income tax, with surtax, death duties, and stamp duties. Its chief offices are at Somerset House, London, and it has branches in Edinburgh and all over the U.K.

Inland Sea. Almost entirely landlocked basin in Japan. It lies between S. Honshu and the smaller island of Shikoku, and extends for 240 m. from Osaka Bay to the Strait of Shimonoseki, with a width varying from 3 to 30 m. It communicates with the Pacific Ocean by the Straits of Akashi and Naruto, between which lies the isle of Awaji, and the Strait of Hayasui between Shikoku and Kyushu.

The sea comprises a number of basins joined by narrow, island-studded channels. In late Tertiary times the sea filled in a fracture between the fold mountains of Honshu and Shikoku, thus making the basin, which resembles in character and formation the similar narrow arms of the sea on other portions of the Pacific coast. In places only from 50 to 90 ft. deep, the sea is deepest at Hayasui Strait, 541 ft. Tides rise from 6 to 14 ft., and entering from both sides cause complicated currents, with speeds from 7 to 10 knots, and eddies, which impede navigation. The sea requires skilful pilotage. Among fish obtained here are sea bream and grey mullet. The

granite rocks of the coasts, backed by the symmetrical cones of distant volcanoes and the green of pine forests, give the voyage from Kobe to Moji an element of charm. During the Second Great War U.S. aircraft sealed off the three entrances to the Inland Sea with mines.

Inland Voyage, AN. First volume published by R. L. Stevenson. It appeared in 1878 and describes a holiday trip which he and Sir Walter Simpson took in canoes on the Sambre and the Oise in 1876. They started from Antwerp and, passing along the canals, reached the Oise. The little volume contains some charming musings.

Inlaying. Production of ornamental designs on wood, metal, or other substance by fitting the design, of thin material, into the surface. As the fitting is perfect and the finished outer surface level, the design shows chiefly by difference in colour. Some work of high quality is engraved. The process is used in furniture and some classes of metalwork. Furniture requires woods of different natural colours, together with dyed woods, also tortoiseshell, metal, ivory, and mother-of-pearl.

Applied to furniture, the term strictly means cutting out a surface, which is inlaid. Under A. C. Boule (1642-1732), cabinet-maker to Louis XIV, veneer was made, although the manufacture had originated in Italy. Conventional floral and other patterns were cut in the veneer or metal sheet, and into counterpart pieces of coloured wood, tortoiseshell, or metal, the fragments being pieced together into one flat surface. The whole was then laid with adhesive on a prepared wooden ground. This was marquetry in contradistinction to inlaying; it also originated in Italy. Inlaying became relegated almost exclusively to narrow lines and bands.

Sometimes two or more lines of different coloured woods are inlaid

side by side, or there may be one single line. Bands may be to a pattern, bound together on the edges with lines. In the Empire period inlay and marquetry were of brass. Probably as the result of the evolution explained, marquetry furniture is commonly designated inlaid furniture.

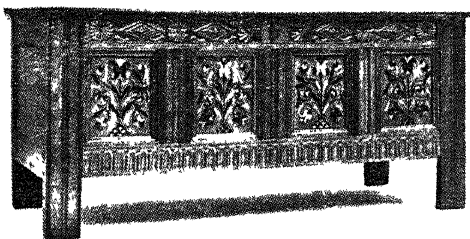
The insertion of shell in bone, and of bone in wood, introduced in the Neolithic age, is widespread in primitive culture. In early Egypt the incrustation of gold jewelry with coloured stones is traceable to the XIIth dynasty. Stone and ivory inlays, greatly favoured in ancient Tartary, may have been carried thence to the Crimea, whence they spread to W. Europe in the early Iron age. Coral inlay, known in Britain before 300 B.C., was displaced by vitreous paste, thus giving rise to the art of enamelling. In early Byzantine times silver inlay on bronze was practised and passed into the Saracenic art of gold and silver inlay on copper or iron, especially from the 12th to the 16th century. It survives in India, China, and Japan. Agate and other stones, when inlaid in marble, produce *pietra dura* work. A choice style of medieval Chinese lacquer was inlaid with mother-of-pearl. See Biddery; Cabinet-making; Damascening; Furniture; Marquetry.

Walter Coventon

In Loco Parentis (Lat. in the place of a parent). Legal phrase describing the relationship in which guardians and schoolmasters stand towards the infants whose custody is entrusted to them, involving the right to control their movements and regulate their behaviour. The king is said to stand *in loco parentis* to all the infants in the kingdom. See Children, Law about.

Inman, PHILIP ALBERT INMAN, 1ST BARON (b. 1892). British administrator. Born June 12, 1892, he was educated at Harrogate and Leeds, Chairman of a publishing co., and director of a hotel co., he was long chairman of Charing Cross Hospital. He was raised to the peerage in 1946 and appointed chairman of the B.B.C., but resigned early in 1947 on being appointed lord privy seal, an office he held for only a few months. In 1948 he became chairman of the hotels executive of British Rlys.

Inman, MELBOURNE (b. 1873). English billiards professional. A Londoner, he became marker at the Twickenham club when 14. Long supreme among English players, he developed an open and attractive game which brought



Inlaying. Early 17th century English oak chest, inlaid with holly and bog oak

Victoria and Albert Museum, S. Kensington

him the world championship in 1908-09, 1912-14, and 1919. He was eventually beaten by Willie Smith.

Inman, WILLIAM (1825-81). British shipowner. Born at Leicester, April 6, 1825, he was educated at Liverpool, and in 1849 became a partner in the merchant firm of Richardson Brothers. In 1850 he dispatched the *City of Glasgow*, screw steamer of 1,600 tons, full of emigrants to Philadelphia. This was the beginning of the Inman Line, which in 1857 extended its operations to New York under the title of the Liverpool, New York, and Philadelphia Steamship Co. Inman died July 3, 1881.

In Memoriam. Poem by Tennyson written in memory of his friend at Cambridge, Arthur Hallam (1811-33). It was printed privately for presentation to a few friends in 1850, and the same year published anonymously. The most deeply felt of Tennyson's works, it expresses his grief, but can also "faintly trust the larger hope." The metre, which has come to be called after this poem, had been employed by Jonson.

Inn. House where travellers and others are fed and lodged for gain. The word is a form of *in* (within), and means primarily a lodging in relation to its inmate. The earliest inns were the caravanserais and khans of the East, where lodging was provided. In the stable of such an inn Jesus was born.

Greek and Roman inns were little more than drinking shops, but Roman posting-houses on great roads were superior establishments closely resembling the later inns. In the Middle Ages hospitality was provided chiefly at castles, country houses, and monasteries. The old inns were usually built in the form of a hollow square, the great yard, entered by an archway with massive gates, being surrounded by galleries, upon which the bed-chambers opened. From the Elizabethan period down to the 18th century the inns were the resort of wits, poets, and writers. During the coaching period they enjoyed great prosperity, which declined with the coming of the railways. Bicycle and motor car revived the fortunes of the roadside inn.

Memorable among English inns is the Tabard, Southwark, built in 1307, the starting point of Chaucer's *Canterbury Pilgrims*. After being partly destroyed by fire in 1676, it was rebuilt in the original style, but was demolished

after 1870. At Canterbury the Pilgrims put up at the Chequers of the Hope, of which the lower part of the walls and the crypt alone survive. London taverns associated with great Elizabethan writers are the Mermaid, in Bread Street, the scene of many "wit combats" between Jonson and Shakespeare, the Devil Tavern near Temple Bar, the Three Cranes in the Vintry, and Mistress Quickly's tavern, the Boar's Head, in Eastcheap. The Mitre, in Fleet Street (since demolished), was Dr. Johnson's favourite haunt.

One of the most picturesque of English inns is the exquisite half-timbered Feathers at Ludlow, with its magnificent carved front and beautiful ceilings, panelling, and fireplaces; but this was not originally an inn. Other good examples of so-called "magpie" or "black-and-white" inns are the Old Hall at Sandbach (originally the manor house), the Bear's Head at Brereton, the Swan and Lion at Congleton, the Bear and Billet at Chester, formerly the town mansion of the earls of Shrewsbury, and the Pounds Bridge Inn between Penshurst and Speldhurst, Kent, which was built as a residence by a former rector of Penshurst.

The Luttrell Arms at Dunster, Somerset, is a fine 15th century building, supposed to have been the town residence of the abbots of Cleeve. Over the stone porch, which has two arrow slits, is the carved stone sign—the arms of the Luttrell family. The windows overlooking the courtyard are beautifully carved, the oak room has a Gothic hammer-beam roof, and in a bedroom is a 17th century plaster overmantel in high relief. Of the few galleried inns that survive, the finest is the New Inn, Gloucester (*see* illus. in page 4509), built 1450-57 to accommodate pilgrims to the shrine of the murdered Edward II.

There are galleries at the George, Huntingdon, remains at the Bull, Dartford, the George, Winchcomb, and a two-storeyed one at the George, Southwark. The King's Head, Aylesbury, now a public house, is supposed to have been either a refectory of Grey Friars or a guildhall. It has a magnificent oak window with fine stained glass, and in the taproom a massive oak cornice and moulded ceiling ribs meeting in a carved boss. The George, Glastonbury, has its original Perpendicular stone front (*see* illus. in page 4509). The frontage of the Star at Alfriston

has fine carvings and is roofed with large slabs of Horsham stone.

The Maid's Head, at Norwich, has a Jacobean bar, a 15th century fireplace, and a Norman cellar. The George, Norton St. Philip, formerly a Carthusian hostel, consists of a massive stone ground floor and a timber upper storey. The Ostrich (perhaps a corruption of hospice) at Colnbrook, originally a hospice given in trust to the Benedictine abbey of Abingdon, is an interesting example of a 17th century coaching inn. In the upper storey of the frontage was a door through which passengers from the top of the coach were able to step straight into the house. *See* Hotel.

Bibliography. *Tales of Old Inns*, R. Keverne, 1939; *The Old Inns of England*, A. E. Richardson, new ed. 1942; *English Inns*, Thomas Burke, new ed., 1944.

Inn. River of Europe. It rises in a small lake in the canton of the Grisons, Switzerland, and flows through the Engadine. Having entered the Austrian Tirol, it flows by Innsbruck and, leaving Austria near Kufstein, enters Bavaria and joins the Danube at Passau. It is about 310 m. long, and its course is mainly N.E. In its earlier course it is a rapid and beautiful mountain stream; in Bavaria it is a great river with islands thereon, and brings down a great bulk of water to the Danube. Its main tributaries are the Salzach and Alz. Navigable for small vessels from below Innsbruck, in its lower course it forms part of the W. Austrian frontier.

Inner Circle. Section of London's underground rly. system. Built, 1863-84, by the Metropolitan railway, it runs round the cities of London and Westminster from Notting Hill Gate in the W. to Aldgate in the E. It serves, among other things, as a connexion between the various London termini, *e.g.*, Liverpool St., Cannon St., Charing Cross, Victoria, Paddington, King's Cross. The line was electrified in 1905 and in 1933 was absorbed by L.P.T.B. From 1872 to 1905 there were an Outer Circle, L.N.W.R. and Metropolitan District rly. between Broad Street and Mansion House via Willesden Junction; and a Middle Circle, G.W.R. and Metropolitan District rly. between Moorgate and Mansion House via Hammersmith.

Politically, the term inner circle is applied to the higher executive posts in the British cabinet: usually the prime minister, lord

president of the council, foreign secretary, chancellor of the exchequer, and lord privy seal. The inner circle of the Magic Circle (*q.v.*) consists of the most expert conjurers and illusionists.

The inner circle of a standard rifle target is that part surrounding the bull, the other circles being the magpie (middle) and outer.

Inner House. Name given to the upper court of the court of session of Scotland. It is the court of appeal from the outer, or lower, house. It sits in two divisions, each of four judges, who bear the title of lord. The president of the court of session presides over one division and the lord justice clerk over the other. See Session, Court of.

Innerleithen. Burgh of Peebles-shire, Scotland. It stands on Leithen Water, near where it falls into the Tweed, 6 m. S.E. of Peebles, on the railway. Woollens are made, and the place is visited for its mineral springs. It has a pump room. The parish church and other buildings are modern, as before about 1790 this was only a small village. The spring is supposed to be Scott's S. Ronan's Well. Near the town are Traquair (*q.v.*) with its old palace, Walkerburn with its antiquities, and Horsburgh Castle. The old name was Hornehuntersland. Pop. 3,747.

Inner Temple. In England, one of the four inns of court. As an inn of court it dates from about 1440, and with the Middle Temple made its home in the house of the Knights Templars in London. See Barrister; Inns of Court; Temple.

Innes, ARTHUR DONALD (1863-1938). British historian. Son of a soldier who became a general,



A. D. Innes,
British historian

he was born in India, Sept. 15, 1863. Educated at Marlborough and Oriel College, Oxford, he was for a time on the editorial staff of Cassell & Co. Associate editor of Harmsworth's History of the World, he also lectured at the School of Oriental Studies. His many books include a History of the British in India, 1902; History of England and the British Empire, 1913-14; Class-book of European History, 1929-30; Colonial and Maritime Expansion of England, 1932. Innes died April 19, 1938

Inness, GEORGE (1825-94). An American painter. Born at Newburgh, N.Y., May 1, 1825, and virtually self-taught, he chose most of his subjects from his native land, but resided for periods in France and Italy, and died during a tour in Scotland at Bridge of Allan, Aug. 3, 1894. He was elected to the National Academy in 1868. Notable pictures were The Apocalyptic Vision of the New Jerusalem, and The River of Life (from the tenets of the Swedenborgian Church, to which he belonged); also Moon Rise in Florida, American Sunset, and S. Peter's from the Tiber.

Innholders' Company. London city livery company. Originating in the 14th century among



Innholders'
Company arms

hostelers and hay-mongers, it received a charter in 1514 inscribed to the art and mystery of S. Julien le Herbague, patron saint of travellers. At the time of its incorporation inns were beginning to take the place of monastic establishments as resting places for travellers, and every tavern-keeper was compelled to belong to it. Other charters followed in 1663, 1664, and 1685. The hall, in College Street, E.C., was reconstructed about 85 p.c. in 1885-86. The first hall, in existence in 1522, was burnt in 1666 and replaced in 1668-70.

Innisfail OR INISHFAIL. Poetical name for Ireland. It means the island of the tail, this being the stone of destiny on which Jacob is supposed to have slept when journeying. The belief was that it was brought to Ireland and used as the coronation stone. See Lia Fail.

Inniskilling Dragoons, 5TH ROYAL. Cavalry regiment of the British army. Raised by G. Hamilton, a governor of Enniskillen, N. Ireland, for service against James II in 1689, it was taken on the British establishment as the 7th Horse. Later called the 5th Dragoons (Inniskilling), it absorbed the 6th Dragoon Guards in 1922. It served with Marlborough at Blenheim, Ramillies, Oudenarde, and Malplaquet. The 6th Dragoons fought at the Boyne, and in 1743 won a battle honour at Dettingen under George III. The 5th Dragoons were at Salamanca and Vittoria in the Peninsular War, and the 6th fought at Waterloo. Both regiments were in the charge of the

Heavy Brigade at Balaclava. The 6th served throughout the first Boer War, 1881, and both were in the S. African War of 1899-1902, when the 5th took part in the defence of Ladysmith.

Their combined honours from the First Great War included Mons, Le Cateau, Marne, 1914; Messines, 1914; Ypres, 1914, '15; Somme, 1916, '18; Cambrai, 1917, '18; Amiens, Hindenburg Line, Mons, 1918. Mechanised in 1936, the 5th Royal Inniskilling Dragoons served early in the Second Great War in France. They then formed part of the armoured reserve in the U.K. against the possibility of a German invasion. Landing in Normandy in July, 1944, the regiment joined the 7th armoured div., with which it continued to serve, except for a short attachment to the 53rd (Welsh) div., until the German capitulation.

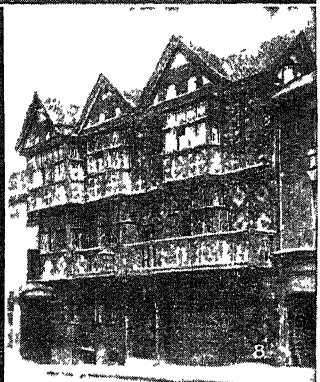
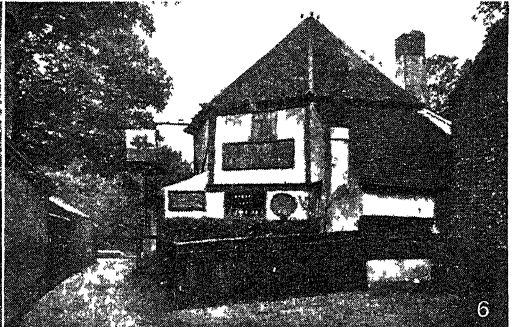
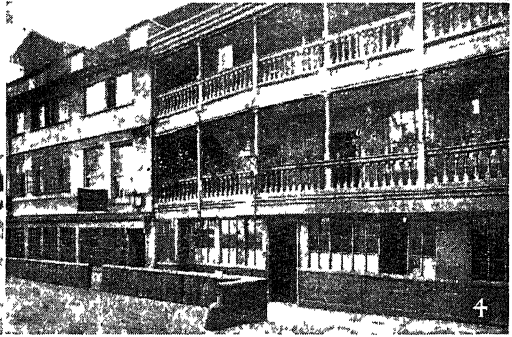
Inniskilling Fusiliers, ROYAL Regiment of the British army. For its gallant defence of the town



Inniskilling
Fusiliers badge

of Enniskillen, N. Ireland, in 1689, part of the garrison was formed into two regiments the 27th Foot (Inniskillings) and the Inniskillings (6th Dragoons). The former fought in Canada and gained its first battle honour at Martinique in 1762. In 1801 it helped to capture Alexandria. The regiment distinguished itself at Maida in 1806, gained eight honours in the Peninsula, and was at Waterloo. The followed service in S. Africa, and in Central India during the Mutiny.

In 1861 the 27th Foot received its title of Royal Inniskilling Fusiliers, and in 1888 the 108th Foot was constituted the 2nd battalion; the latter had been raised in 1854 as the 3rd Madras Europeans in the East India Company's service. Part of the Irish Brigade, the regiment took part in the relief of Ladysmith. Thirteen battalions were raised for the First Great War and earned the battle honours: Le Cateau; Somme, 1916, '18; Ypres, 1917, '18; St. Quentin; Hindenburg Line; France and Flanders, 1914-18; Macedonia, 1915-17; Gallipoli, 1915-16; Palestine, 1917-18. During the Second Great War, battalions were in France, Madagascar, Persia, N. Africa, Sicily, and Italy. The depot is at Omagh, Tyrone.



1 The George, Glastonbury, a 15th century pilgrims' hostelry. 2 The George, Norton St. Philip, Somerset, probably the oldest English inn, 15th cent. 3 The Star, Alfriston, 16th cent. 4 The George, Southwark, and, 5, The New Inn, Gloucester, two well known coaching houses. 6 The Fighting Cocks, St Albans, originally a monastic building. 7 The Fox and Hounds, Barley, Herts, with its old sign across the road. 8. The Feathers, Ludlow, a timbered building of 1603

INN: SOME OLD HOSTELRIES OF THE ENGLISH ROADS
By arrangement with Country Life

Innkeeper. One who keeps a house where travellers are provided, for profit, with board and lodging and whatever they may require while on their journey. Innkeepers are bound to receive and entertain for a reasonable time at a reasonable charge any traveller applying for admission if there is accommodation available and the applicant behaves properly.

Innkeepers are liable for loss of or injury to their guests' goods, money and baggage, and are responsible for the acts of their servants and also for those of other guests. The Innkeepers Act, 1863, exempts them from liability for loss or injury to goods or property, other than horse or other animal or carriage, brought to the inn, to an amount exceeding £30, unless such property has been stolen or injured through default or neglect on the part of the innkeeper or his servants or has been expressly deposited with them for safe custody. On the other hand, innkeepers have a lien on the goods of guests for board and lodging, and after six months may sell by public auction any property left behind by a guest leaving in debt, provided they advertise their intention of doing so at least one month beforehand. *See* Hotel; Liquor Control.

Innocent. Name of 13 popes. Innocent II, a Roman pope, 1130-43, was disturbed by the rival claim of the anti-pope Anacletus II (d. 1138). Innocent IV, pope 1243-54, renewed the excommunication against the emperor Frederick II, and finally at the council of Lyons, 1245, deposed the emperor and ordered a new election. Innocent V, the first Dominican pope, only reigned from Jan. to June, 1276. Innocent VI, pope 1352-62, was a Frenchman named Aubert, who reigned at Avignon.

Innocent VII was pope 1404-6 during the schism of the anti-pope Benedict XIII. Innocent IX, when 72 years old, was pope Oct.-Dec., 1591. Innocent X, pope 1644-55, was largely dependent on the counsel of his sister-in-law, Olimpia Maidalchini. Innocent XIII, pope 1721-24, was the son of the duke of Poli.

Innocent I (d. 417). Pope 402-417. A native of Albano, he was brought up in the service of the Church at Rome, and made pope on the death of Anastasius I. His correspondence is the chief authority for his life. He was active in dealing with prevalent heresies, and in maintaining the supremacy of the Petrine see.

Innocent strongly supported John Chrysostom when he was wrongfully ejected from the see of

Constantinople. In response to an appeal from five African bishops, he confirmed the condemnation of Pelagianism by the African synods. Rome was attacked by the Goths under Alaric in 408, during his pontificate, but when the city was sacked in 410 the pope was absent on an embassy to the emperor Honorius at Ravenna to try to arrange terms of peace. He died March 12, 417, and was declared a saint. His festival is kept on July 28.

Innocent III (1160-1216). Pope 1198-1216. The son of Count Trasimund of Segni and nephew of Clement III, he was born at Anagni. Educated at Rome, he studied theology at Paris and law at Bologna. He held various offices under four popes from 1181-91; was created cardinal, and on the death of Celestine III, Jan. 8, 1198 was elected his successor.

The restoration of the temporal power of the papacy in Rome and Italy, the reconciliation of the spiritual and temporal power in Europe, and the recovery of the Holy Land, were the primary objects of Innocent's pontificate. In Germany the coronation in 1198 of Philip of Swabia and Otto, son of Henry the Lion, as candidates respectively of the Ghibelline and Guelph parties, established two rival claimants to the imperial crown. The pope, without entirely committing himself at first, showed favour to the Ghibelline candidate, but in July, 1201, he announced his approval of Otto, publishing his famous *Venerabilem* (May, 1202), which, while maintaining the right of princes to elect their head, reserved to the pope the right of approving or annulling their choice. On the murder of Philip in 1208 Otto, at the pope's invitation, was crowned emperor at St. Peter's, Rome.

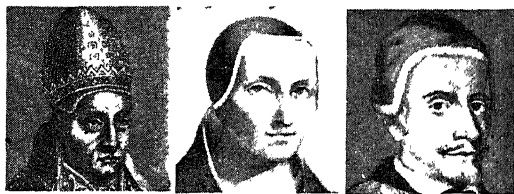
Almost at once, however, Otto seized estates to which the Church had a claim. Innocent excommunicated him and, turning to the French king and the German princes, induced them to elect in his place the young king Frederick II of Sicily, who owed that kingdom to the good offices of the pope. The conclusion of the struggle enabled Innocent to crown his work by calling a general council at the Lateran, Nov., 1215, which proclaimed the fifth crusade.

The pope's sphere of influence

was by no means confined to Germany. Soon after his accession he ordered the warring kings of France and England to come to terms or to agree to a five years' truce. From Scandinavia, where he adjudicated in the matter of succession to the Norwegian throne, to Bulgaria, whose king received his crown at the hands of the papal legate in 1204, the pope exercised his claim to spiritual overlordship, but his most marked triumph was in England when John made an abject submission to him. The crusade against the Albigenses was ordered by him after the failure of other measures and the murder of the papal legate.

During the preparations for the fifth crusade, Innocent died at Perugia, July 16, 1216. He was one of the greatest of the popes, and under him the pontifical authority was much increased. His body was removed to the Lateran from the cathedral of Perugia by order of Leo XIII, 1891. *Consult* Life, L. E. Binns, 1931.

Innocent VIII (1432-92). Pope 1484-92. Born at Genoa, the son of a Roman senator, Giovanni Battista Cibo became bishop of Savona in 1467. He was made a cardinal in 1473, and on Aug. 29, 1484, was elected pope. His efforts to provide for two children, born to him out of wedlock before his ordination, caused scandal. He declared Henry VII to be king of England. Torquemada was made grand inquisitor of Spain by this pope, whose support of the French against the Aragonese king of Naples led to his being besieged in



Popes Innocent. Left to right, Innocent I, Innocent III, and Innocent XI

the Vatican by disaffected Roman nobles. He died July 25, 1492.

Innocent XI (1611-89). Pope 1676-89. Born at Como, May 16, 1611, Benedetto Odescalchi was educated in his native city by the Jesuits, and studied law at Rome and Naples. By Urban VIII he was appointed to various offices in the curia, and in 1647 was created cardinal. From his election to the papacy, Sept. 21, 1676, his pontificate was mainly taken up by the struggle against the encroachments of Louis XIV of France.

In reply to the pope's opposition to his extension of the right over vacant sees, Louis convoked an assembly which, as the declaration of the French clergy, put forward the four articles embodying the doctrine of Gallicanism. This was condemned by the pope, 1682, who refused to accept the nomination to bishoprics of those clergy who had taken part in the assembly. Louis seized the papal territory at Avignon and threatened a schism. The scant sympathy manifested by the pope with James II of England was due to the latter's support of the French king. The doctrine of quietism was condemned by Innocent in a decree of 1687, and his leniency to the Jansenists was afterwards used as an argument against his proposed beatification. He died Aug. 11, 1689.

Innocent XII (1615-1700). Pope 1691-1700. Antonio Pignatelli, a Neapolitan, born March 13, 1615, entered at 20 the Roman curia. He was successively nuncio to Tuscany, Poland, and Vienna, made cardinal in 1682, and archbishop of Naples in 1687. He was elected pope in succession to Alexander VIII by way of compromise, July 12, 1691. By bull, issued 1692, he forbade any pope to make more than one of his relatives a cardinal. He healed the breach with France by obtaining from Louis XIV a repeal of the declaration of the clergy, and confirming those bishops whose appointment Innocent XI had refused to sanction. He died Sept. 27, 1700.

Innocents Abroad, THE. Humorous travel book by Mark Twain (S. L. Clemens), published in 1869 with the full title of *The Innocents Abroad; or, the New Pilgrims' Progress: Being Some Account of the Quaker City's Pleasure Excursion to Europe and the Holy Land*. See *Twain*, Mark.

Innocents' Day, HOLY INNOCENTS, OR CHILDERMAS. Holy day of the Christian Church. It is observed in the West on Dec. 28, in the Greek Church on Dec. 29, in memory of the children massacred by Herod in Bethlehem (Matt. 2). Regarded as adding to the solemnity of Christmas, Innocents' Day has been observed since the 4th century. In England before the Reformation the day was observed by the use of mourning vestments, muffled peals, and processions of children.

Innominate Artery (Lat. *innominatus*, unnamed). Branch of the aorta or main blood-vessel of the human body. It lies behind the upper part of the breastbone.

Innominate Bone. The hip-bone. The innominate bones, one on each side, are united in front and separated behind by the sacrum, the whole ring of bones forming the pelvis. The hip-bones transmit the weight of the body to the lower limbs. Each bone consists of three parts, the ilium, ischium, and pubis, which are separate in early life. The ilium forms the upper expanded part of the bone, and is bounded superiorly by a crest which can be felt externally at the side of the lower part of the abdomen. The external surface gives attachment to the gluteal muscles (*q.v.*). See *Hip-joint*.

Innsbruck. Town of Austria, capital of Tirol. It stands mainly on the right bank of the Inn, at a height of 1,880 ft., 60 m. S. of Munich. Picturesquely situated, it is sheltered on the N. by lofty peaks, and the climate is pleasantly mild during winter. The old town near the Inn bridge contained the Goldnes Dachl, a roof of gilt copper over an elaborate balcony dated 1500 and connected with Maximilian I, and the Franciscan church, built about 1550 to contain the emperor's monument. This was an imposing cenotaph of marble surrounded by bronze statues, among which that of King Arthur as a German knight was noteworthy. The church showed a memorial to Andreas Hofer (*q.v.*), whose name is also connected with Berg Isel, S. of the town, where fighting took place in 1809, and with the Golden Eagle inn, from which he harangued the people. Near the Hofburg was the church of S. James (18th century), with altarpiece by L. Cranach the elder.

The university, founded 1672, had a library of over 200,000 volumes. Close by was the Ferdinand museum, with collections mainly of Tirolese interest, including a picture gallery in which old masters were represented. In the suburb of Wilten, to the S., was a great church in the baroque style belonging to

an abbey founded, it is said, in the 12th century. Here was the site of the Roman station Veldidena. Innsbruck had many street memorials, including a triumphal arch set up in 1765 to celebrate the wedding of Maria Theresa's son Prince Leopold, afterwards Leopold II, to Maria Louisa of Spain.

Until the Second Great War Innsbruck was a popular tourist resort. It has several industries, including cotton manufacture, the making of mosaics, and glass painting. Since most of the rly. traffic for the Brenner pass into Italy goes through it, Innsbruck was a target for Allied bombers during the later stages of the war, suffering considerable damage. It surrendered May 4, 1945, to troops of the U.S. 7th army. Pop. 78,395.

Inns of Court. Name of four English legal societies possessing the exclusive right of calling persons to the bar. They were so called from affording residence to members. Originating in the 13th century, they include benchers (or senior members), barristers, and students, and are managed by the benchers, who are coopted. They are Lincoln's Inn, Inner Temple, Middle Temple (*see* Temple), and Gray's Inn, are on a footing of equality, governed by no prescribed legal provisions, statute, or charter, virtually exempt from the orders, jurisdiction, or interference of the courts, and possess a right to disbar any member for misconduct, subject to a right of appeal to the judges. By the Sex Disqualification (Removal) Act of 1919, membership of the inns is open to women, as it is to citizens of all nations except in wartime.

In the 16th century lesser inns or hostels were subject to the control of the four great inns. At one time a law student served an apprenticeship in an inn of chancery before he joined an inn of court. The inns of chancery, whose connexion with the inns of court exists no longer, were Clement's, Clifford's, Staple, Lyon's, New, Strand, Thavies', Furnival's, and Barnard's Inns. There were also two Serjeants' Inns, members being serjeants-at-law, the last of whom died in 1899.

In Scotland the Faculty of Advocates has similar powers and functions. See *Bar*; *Barrister*.



Innsbruck, Austria. Pre-war view of the main street. See also Austria illustration in p. 801

and under the names of the various inns; consult also Early Holborn and the Legal Quarter of London, E. Williams, 1927; Wig and Gown, R. J. Blackham, 1932; History of English Law, W. S. Holdsworth.

Innuendo (Lat. *innuere*, to nod to, hint). In English law, the defamatory meaning which the plaintiff alleges the words to bear in a libel and slander case. Thus, the plaintiff will charge that the defendant said, "He is a lame duck," implying that *the plaintiff was a man who could not pay his debts*. The words in italics are called the innuendo, which literally means "by hinting."

Ino. In Greek mythology, daughter of Cadmus, king of Thebes. She married Athamas, king of Minyae in the Boeotian Orchomenus. See Athamas.

İnönü, İSMET (b. 1884). President of the Turkish republic. Born at Smyrna (Izmir), he attended military and staff colleges, and served as a corps commander during the First Great War. A life-long friend and collaborator with Kemal Atatürk, he organized the nationalist army, and as chief of the general staff played a leading part in defeating the Greeks at the battle of İnönü in 1922. With the introduction of family names in Turkey in 1934, he chose to commemorate his victory. As foreign minister he signed the Lausanne treaty of 1923. He then became the first premier of the republic, a position he held until 1937. On Atatürk's death the following year he was elected president.

İnönü continued his predecessor's policy of carrying out reforms, and after the fall of France in 1940 affirmed Turkish non-belligerency and friendship for Great Britain in face of aggressive Axis policy in S.E. Europe. He met Winston Churchill at Adana in Jan., 1943, to discuss the strengthening of Turkish forces by increased supplies of Allied equipment, and in Dec. attended a conference at Cairo, with Churchill and Roosevelt. İnönü was re-elected to the presidency on March 8, 1943, and again on Aug. 5, 1946.

Inoculation. The introduction under the skin or into a muscle of a measured quantity of killed

micro-organisms of certain diseases, or of their toxins, in order to protect the patient against the specific disease. Inoculation is made by a hypodermic syringe. Several inoculations, increasing in strength, may be spaced over some time, affording a protection which varies in duration. Inoculation is useful because of its challenge to the white cells and to the whole protective mechanism of the body; stimulated by the presence of the enemy substance, these cells react in anticipation of attack and so are adequate to repulse the living micro-organism should it invade the tissues. See Immunity.

Inositol or **INOSITE**. White substance ($C_6H_{12}O_6$) with a sweet taste, first found in the muscle fluid of the ox's heart. It has since been discovered in young French beans (*Phaseolus vulgaris*), and hence is also called phaseomannite. Other vegetable substances yield inositol, and it is conveniently prepared from walnut leaves. It is one of the growth-forming factors associated with yeast.

In pari delicto (Lat., in equal fault). Term of English law. If A sues B, alleging an illegal act, and it is disclosed that the whole transaction between them was illegal, and both are guilty, the plaintiff fails. For example, money deposited as security for refreshments to be supplied to a brothel was held irrecoverable.

In Partibus Infidelium (Lat., Among unbelievers). A Roman Catholic term for titular bishops. In the 13th century the success of the crusades induced the popes to establish sees within Mahomedan countries. On the relapse of these districts into infidel hands, however, the incumbents of these sees were unable to occupy them, but the titles were retained in *partibus infidelium*. Until the pontificate of Leo XIII in *partibus* sees were conferred on coadjutor bishops and dignitaries who, for one reason or another, were not installed in actual cures. Until 1850 R.C. episcopacies in Great Britain were composed of in *partibus* bishops.

Inquest (O. Fr. *enqueste*, from Lat. *inquisitum*, passive part. of *inquirere*, to inquire into). Judicial inquiry. Historically it is intimately associated with trial by jury, introduced into England by the Norman conquerors. The word is now mainly restricted to an inquiry held by the coroner (*q.v.*) into the cause of death in certain circumstances, in respect of treasure trove, and, in the city of London, into the origin of fires

causing loss or injury. In the first matter, a coroner's inquest is held to ascertain the cause of death of a person "where there is reasonable cause to suspect that such person has died either a violent or an unnatural death, or has died a sudden death of which the cause is unknown, or that such person has died in prison."

A coroner's inquest, though it may terminate in the committal of a person for murder or manslaughter, is not a trial, and the laws of evidence which hold good in other courts are not insisted upon in the coroner's court. Hearsay evidence is admissible. The coroner must hold an inquest with a jury where there is reason to suspect that death was due to murder, manslaughter, or infanticide, or took place in prison, or (until the Second Great War) was caused by a street accident. The coroner must view the body but the jury need not do so unless the coroner so directs or a majority of the jury so decide.

Witnesses are then called and examined on oath. A person suspected of having caused the death may attend and give evidence, or he may reserve his evidence. Witnesses are questioned directly by the coroner, and a solicitor or barrister may not ask questions on behalf of any person except by his permission. The evidence may include that of a medical man who has made a post-mortem examination of the body by order of the coroner.

At the conclusion of the evidence the coroner sums up the case if there is a jury, and the jury, who may retire if they wish, then arrive at a verdict. The jury is also entitled to make comments on the case, which are termed riders. See Coroner; Jury.

Inquisition or **HOLY OFFICE**, **THE** (Lat. *inquisitio*, inquiry). Tribunal of the Roman Catholic Church for the suppression of heresy. Originating in 1248, it became a terrifying instrument of oppression in Spain in 1478 and in the Netherlands in 1567, but since the 19th century has been confined to the repression of heretical literature (see Index Librorum).

Heresy was a serious offence against the State in the time of the ancient religions; it was so regarded by Constantine and his successors when Christianity was adopted by the Roman Empire. Theodosius regarded it as a capital offence. By various councils bishops were enjoined to extirpate it. The spread of such bodies as



İsmet İnönü,
Turkish President

the Cathari, Waldenses, and Albigenes led the Church to take more active steps. Innocent III in 1215 sent special delegates, including Dominic, to Languedoc and other parts of southern France to inquire and report to Rome. In 1216 Dominic founded his order to repress heresy; its members, who were supplemented by a force called Christ's Militia, became known as *Domini canes*, hounds of the Lord. The Inquisition proper was founded 1248 by Innocent IV. Dominicans then and after were entrusted with its chief direction. The institution of the Congregation of Cardinals of the Holy Inquisition at Rome in 1542 by Paul III, remodelled by Sixtus V, was prompted by what the papal authorities regarded as the dangerous spread of Lutheranism.

The first tribunal of the Inquisition was set up at Toulouse. The system gradually extended to Italy, except Naples; to Spain, Portugal, Peru, Mexico, Goa, the Netherlands, and Germany. The first inquisitor-general to condemn heretics to the stake was a Dominican, Petro de Verona, who was slain by the populace at Como in 1252, and later canonised as Peter Martyr; he was one of several who met a similar fate. Procedure and punishments varied in degree in different countries, but were specially severe in Spain, where for political and other reasons the Inquisition was re-organized by the State, with the permission of Sixtus IV, in 1478, and directed against the Jews and Moors, who were suspected of treasonable plots. Torquemada was inquisitor-general 1483-98; Diego Deza, 1499-1506; and Ximenes, 1507-17. The statement of Llorente, secretary of the tribunal at Madrid, 1790-92, that more than 340,000 persons were executed is disputed by other authorities, but the number, exclusive of those otherwise dealt with, was undoubtedly large and the tortures inflicted were terrible.

Methods of Procedure

The Spanish Inquisition was directed against words and actions, thoughts and assumed intentions. The accused, if he disobeyed the summons of the tribunal, was seized. One informer was enough to secure this. He might be accused of heresy, of favouring heretics, of hindering the Holy Office, of withholding information regarding heretics, of blasphemy, sorcery, witchcraft, Judaism, infidelity, polygamy, seduction, etc. He was not allowed to know the name of

his accuser or even, at first, the charge against him. He was kept in durance at the pleasure of his judges. He was plied with questions and induced by artifice to incriminate himself or others. If recalcitrant he was subjected to torture by rack, pulley, fire, water, or the swinging knife. If burnt, his effigy was burnt also. Confiscation of property, banishment, the galleys, and imprisonment for life were minor penalties.

The tribunal sat in secret. Its sentences were proclaimed at what was called an auto-da-fé and carried out by the civil authorities. Torture was introduced in the 13th century. Details of the procedure are given in a manual by Nicolaus Eymeric (d. 1399), pubd. in 1587, reprinted 1762. The Spanish In-

quisition was overthrown by Napoleon in 1808, formally abolished 1813, revived 1814, abolished again 1820, superseded 1823 by an independent Tribunal of the Faith, and finally disappeared 1834-35.

The Inquisition existed in Portugal 1557-1826; was suppressed in Germany at the Reformation; in France in 1598; in Italy in 1870. See Albigenes; Alva; Auto-da-Fé; Dominicans; Heresy; Torquemada.

Bibliography. History of the Inquisition of Spain, J. A. Llorente, Eng. trans., abridged, 1826; History of the Inquisition of the Middle Ages, H. C. Lea, 3 vols., 1906; History of the Inquisition in Spain, H. C. Lea, 4 vols., 1906-07; The Inquisition in the Spanish Dependencies, H. C. Lea, 1908; The Spanish Inquisition, C. Roth, 1938.

INSANITY: A CONCEPT IN LAW

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Once generally used as a term covering any mental illness, the word insanity has come to have, strictly speaking, a legal significance only. Here is an explanation of its meaning in the legal sense. See also Mental Disorder; Psycho-analysis; Psychology, and allied subjects

Insanity, in the past, has been used loosely as a term to include all the more serious forms of mental disability. It has never been possible, however, for any precise definition of the term to be applied, and with the increasing knowledge and understanding of the nature of mental illness it is now considered that the medical use of the word insanity is unsatisfactory. As a substitute, the expression mental disorder is in current use to include all degrees of mental ill-health. Insanity, therefore, should not be used except in the restricted sense of legal unsoundness of mind. This means that it is only technically correct to speak of a person as being insane when either he has been or he could be certified as "a person of unsound mind."

It is of importance to note that, in the wording of the statutory form, in order to be certifiable under the Lunacy Act a person must be not only "of unsound mind," but also "a proper person to be taken charge of and detained under care and treatment." This indicates to some extent the legal view of the degree of unsoundness of mind which constitutes insanity.

Reasons for certification of a person of unsound mind were summarised by Sir Claude Schuster some years ago thus: (1) to protect the public from injury; (2) to protect the patient from self-injury; (3) to give treatment with a view to cure or amelioration

which cannot otherwise be given; (4) to protect the patient from injury due to want of care.

Those suffering from mental illness can be placed under care, treatment, and control under the provisions of the Lunacy Act, 1890, and Mental Treatment Act, 1930. The methods to be used for those who are willing to receive treatment (voluntary patients) and for those who are incapable of expressing willingness or unwillingness regarding treatment (temporary patients) are detailed in the article Mental Disorder. A person who is unwilling to submit himself for treatment, but is considered to be of unsound mind and "a proper person to be taken charge of and detained" will be dealt with under an order and certified. The usual method for a private patient is by reception order or petition. Five separate documents are required:

(1) The petition, signed if possible by the nearest relative.

(2) Statement of particulars, giving details of name, age, sex, length of illness, occupation, etc.

(3 and 4) Two medical certificates, one written, whenever possible, by the usual medical attendant of the patient. The certifying practitioners must examine the patient separately and each within seven clear days of the date of the presentation of the petition. They must not be related to the petitioner, must not be in partnership together, and must have no financial or proprietary interest in connexion with the patient's treatment and care under detention.

(5) Reception order: this is signed by the judicial authority (county court judge, stipendiary magistrate, or specially appointed justice of the peace) if he is satisfied, after studying the other documents, that the person should be detained. The order authorises the reception of the patient in the mental hospital or home named in the documents. The justice need not himself see the patient; but if he does not it is the duty of the person in charge of the hospital to acquaint the patient of his right to be visited by a justice.

Where a patient's relatives are unable to pay private fees, the method used is by summary reception order. The documents required are:

(1) Statement of particulars.

(2) One medical certificate.

(3) Reception order, signed by a J.P. The medical attendant, on forming the opinion that a patient is now showing symptoms of unsoundness of mind and is in need of care and treatment, can notify the local relieving officer who will arrange either for the attendance of a medical practitioner and justice at the patient's home or for transport to convey the patient to an observation ward on an order which holds good for three days. In the latter case the requirements of the summary reception order may be carried out in the observation ward.

Where there is need for action with the least possible delay, *i.e.* in exceptional cases of dangerous violence, an urgency order may be used. This requires (1) statement of particulars, (2) medical certificate, and (3) order—signed by nearest available relative who has seen the patient within two days. The certifying medical practitioner must give adequate reasons for making use of this urgency method. The order remains in force only seven days, and before the expiration of this period the patient must be either discharged or, if detained, dealt with in some other statutory manner.

Responsibility for Crime

The question of responsibility in the case of serious or major crime when a defence on the ground of insanity is raised is one which continues to exercise the minds of medico-legal experts. In order to establish such a defence it must be clearly proved that "at the time of committing the act the party accused was labouring under such defect of reason from disease of the mind as not to know the nature and quality of the act he was doing or, if he did know it, that he did not know he was doing what was wrong." This quotation is not from any Act but from what are

known as the McNaghten rules which are contained in the answers of certain judges in 1843 to questions put to them by the house of lords following the trial of McNaghten for the wilful murder of Edward Drummond, private secretary to Sir Robert Peel. Since that time the criterion of criminal responsibility has been based on these rules, and judges direct juries accordingly.

If at the beginning of a trial a person is found to be insane, he is said to be unfit to plead and will not be tried. If an accused person during the course of his trial is found to have committed the offence and to have been insane at the time, the jury will return a verdict of "Guilty, but insane." The judge will then make an order for detention "until his Majesty's pleasure shall become known," which implies removal to the criminal lunatic institution.

Ground for Divorce

Under the Matrimonial Causes Act, 1937, a decree of nullity may be granted if "either party to the marriage was at the time of the marriage of unsound mind or a mental defective or subject to recurrent fits of insanity or epilepsy." The court must, however, be satisfied that the petitioner was in ignorance of the state of mind of the spouse at the time of the marriage; that the proceedings were instituted within a year of the marriage; and that marital relations with the consent of the petitioner have not taken place since the petitioner was aware of the grounds for a decree.

Under the same Act a petition for divorce may be presented on the ground that the respondent is "incurably of unsound mind and has been continuously under care and treatment for a period of at least five years immediately preceding the presentation of the petition." "Care and treatment" is held to mean that the patient is under some form of statutory order of the Lunacy or Mental Treatment Acts, or that he has remained under treatment as a voluntary patient without interruption following a period under such order. The evidence of incurability is required to be given by highly experienced medical witnesses.

A person who is certified to be a person of unsound mind, *i.e.* deemed to be insane, may nevertheless, in the eyes of the law, make a valid will and be said to have a sound disposing mind. The conditions which have been

laid down as essential before an individual can be said to have full testamentary capacity are: (1) he must understand the nature of a will; (2) he must understand the effect of a will; (3) he must have reasonable knowledge of the nature and extent of his estate; (4) he must have capacity to appreciate which dependents, relatives, or friends may have reasonable claims upon his bounty; (5) he must not be under any influence, delusion, or suspicion which would cause him to omit any person or persons as beneficiaries who otherwise might reasonably have been included; (6) he must not be under any influence, delusion, or suspicion which would cause him to make any unreasonable gift which otherwise he would not have done.

In English law there is (1947) no actual decision as to the civil liability of a person of unsound mind. It appears that damages may be awarded against an individual although his insanity may be proved. The dictum of a high legal authority was, however, that "a lunatic is liable unless the disease of his mind is so great that he cannot understand the nature and consequences of his act."

In cases of suicide it is usual for the coroner to return a verdict including the words "whilst the balance of his mind was disturbed" whenever there is evidence indicating a degree of unsoundness of mind. This obviates the loss of normal civil rights.

Inscribed Stock. Name given to a form of stock for which no certificates are issued. Instead, the names of the holders are inscribed in a register kept for that purpose at either the Bank of England or some other bank, or at the offices of the crown agents for the colonies. Inscribed stock cannot, like other stocks, be transferred by signing a deed. The holder, or his attorney, must attend at the bank and sign the register if he wishes to sell.

Inscriptions (Lat. *in* upon; *scribere*, to write). Records composed of alphabetic or other conventional characters written, incised, or impressed upon durable materials. They occur upon rock-surfaces and upon stone, metal, clay, wood, and other substances, including buildings, sepulchral and other monuments, foundation deposits, coins, gems, ornaments, seals, pottery, and weapons. Their study is called epigraphy.

Caves and rock-shelters in Palaeolithic Europe sometimes bear

mural drawings of natural objects tending towards simplified or conventionalised forms. The development of metal tools gave an impetus to stonecutting, and stone inscriptions have been of immense importance in unravelling the history of mankind.

The decipherment of the Rosetta stone furnished the key to the language of ancient Egypt, whose history could then be pieced together, partly from papyri, partly from hieroglyphic records on temple-walls, obelisks, and stelae. Babylonian and Assyrian history was similarly revealed through the decipherment of the rock-cut inscriptions at Behistun. It has been recovered from thousands of cuneiform inscriptions on baked clay-tablets, and on such outstanding monuments as the Sumerian statues of Gudea and the Hammurabi code of laws.

Much light has been thrown upon Palestinian history by the cuneiform tablets found at Amarna in Upper Egypt, and by the Moabite, Siloam, and other inscribed stones. Relics of Phœnician enterprise, scattered over the Mediterranean region, include a 10th century inscribed bronze bowl found in Cyprus, and a later tariff of sacrifices in Marseilles. Of some ancient languages, such as Lycian, Phrygian, and Etruscan, modern knowledge comes almost wholly from monumental remains. One of the epigraphical triumphs of the 20th century has been the decipherment of numbers of the Hittite tablets of Asia Minor, but the Cretan records still defy scholars. A library containing inscribed tablets in eight languages was found at the Syrian site of Ras Shamra in the 1930s, and is in process of translation.

The Greeks used to set up inscriptions in their temples recording important events like treaties and laws. At Ankara is a famous marble, recording in Greek and Latin the life work of Augustus. The oldest Latin writing occurs upon a gold fibula from a 6th century tomb at Praeneste, the oldest stone inscription on a 5th century pillar found near the Roman Forum. After the fall of the western empire a by-path of epigraphy is furnished by the runic inscriptions of Scandinavia and post-Roman Britain.

The earliest Chinese inscriptions are found on Shang dynasty bronzes and Chou dynasty stone drums. In 781 a tablet was set up at Hsian to describe the Nestorian faith; in 837 the Five Classics

were inscribed upon tablets still preserved there. In Mongolia 8th century inscriptions in Chinese and old Turkic in the Orkhon valley are important as precursors of later scripts. In the 3rd century B.C. Asoka inscribed upon rocks and monoliths scattered over India edicts proclaiming the ethical ideals of Buddhism. Near Mandalay a pagoda is surrounded by 733 others, each enshrining an inscribed marble slab, the whole forming the complete Burmese text of the Buddhist scriptures.

The full decipherment of the Maya and Aztec inscriptions of

pre-Columbian America still awaits accomplishment. Stone bas-reliefs in Central America have yielded a series of glyphs, mostly denoting the divisions of the calendar. Their pictographic origin is undoubted, but their relationship to phonetic writing lacks definite proof. See Alphabet; Cuneiform; Graffiti; Hieroglyphs; Ogam; Rune; Writing.

Bibliography. Greek Epigraphy, E. S. Roberts and E. A. Gardner, 1887-1905; Latin Inscriptions, J. C. Egbert, 1896; Latin Historical Inscriptions, G. M. Rushforth, 2nd ed. 1946; Greek Historical Inscriptions, M. N. Tod, 2nd ed. 1946.

INSECT: LARGEST CLASS OF ANIMAL

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This general article is supplemented by full entries on the better known insects, e.g. Ant; Bee; Beetle; Butterfly; Fly; Moth; Wasp, etc. See also Arthropoda; and articles on the orders, Aptera; Diptera; Hemiptera; Lepidoptera, etc.

Insects (Lat. *insectum*, cut into) form the largest class in the animal kingdom and belong to the phylum Arthropoda, or jointed-limbed animals. In this same phylum are included crabs, lobsters, scorpions, centipedes, spiders, etc.

About one million different species of insects have been described and named, yet new kinds are constantly being found in tropical and other little explored regions. While more than 20,000 species are known from the British Isles, new kinds are still brought to light from time to time.

The name insect is in allusion to the manner in which the body is made up of ring-like pieces or segments. The head bears a pair of feelers or antennae, and the thorax carries three pairs of legs and usually wings. A metamorphosis is usually undergone.

The vast majority of insects are of small or medium size. Very minute forms or relatively gigantic kinds have to face certain disadvantages and, perhaps for this reason, are not very common. Among the smallest forms are certain beetles that are no more than 0.007 in. long; some of the fairy flies are only slightly larger. The largest insects include certain moths with a wing-expanse of 11 in. The African Goliath beetle has massive proportions, being 4 in. long with a breadth of 2 in. Among British insects the largest include the death's head moth, which measures 5½ in. across its wings, and the silver water-beetle with a length of 1½ in. and up to ¾ in. broad.

STRUCTURE. The cuticle of an insect is the hardened skin which

forms the skeleton of the creature. It is external, and not internal as in a vertebrate animal, and encloses the body like a cylinder. Its main constituent is chitin, and it has the property of resisting decay: that is why collections of insects remain in a life-like state for several centuries if looked after. The external skeleton not only gives attachment to the muscles, but also guards the animal against water-loss—a difficulty which all land animals have to face. The skeleton is almost impermeable to water.

The head of an insect is its sensory and feeding centre. It bears the antennae, eyes, and mouth-parts. The antennae are varied in form and often very different in the two sexes. They are the chief seat of the organs of touch and of smell. The eyes are of two kinds—compound or faceted eyes and simple eyes or ocelli. Compound eyes are situated on either side of the head and are formed of usually numerous lenses or facets of hexagonal form, each with separate underlying visual elements. The ocelli are commonly three, arranged in a triangle, above or between the bases of the antennae. The mouth-parts comprise three separate pairs of jaws, situated one behind the other. They are the mandibles, followed by a pair of maxillae, and the hindmost pair are joined together forming a lower lip or labium. In many insects, e.g. cockroaches, dragonflies, beetles, the mouth-parts are used for biting and chewing; in others, e.g. butterflies and moths, they are modified into a sucking tube; while in

still others, *e.g.* plant-bugs, mosquitoes, horse-flies, fleas, they are adapted for piercing.

The thorax is the locomotory centre of an insect and is formed of three divisions or segments, each bearing a pair of legs. In most insects the second and third of these segments also carry each a pair of wings, except in flies, where it is the middle segment only which bears organs of flight.

The wings are membranous expansions of the wall of the thorax. They are usually supported by a tubular framework of longitudinal ribs or veins, often joined by connecting struts or cross-veins. Some of the most primitive insects, *e.g.* the silver fish of our kitchens and bakeries, are without wings, and there is no evidence that they ever possessed these organs. The females of certain moths and flies have the wings reduced to mere flaps or have lost them entirely—a peculiarity that is believed to have occurred also in lice and fleas.

The abdomen is the region where digestion and excretion take place and also the sexual functions. At its apex it often bears a pair of tail-feelers or cerci, which are very long in mayflies and short in grasshoppers. In the female the abdomen is often provided with an egg-laying instrument or ovipositor. Long and needle-like in ichneumon flies, it is broad and blade-like in long-horned grasshoppers. Amongst ants, bees, and wasps it is no longer used for egg-laying and has become converted into a sting.

Along the sides of the thorax and abdomen in most insects there are minute breathing pores, or spiracles, which lead into an internal network of breathing tubes called tracheae.

GROWTH AND METAMORPHOSIS.

Growth in an insect takes place in cycles interrupted by periods of moulting. Because the cuticle is hard and inelastic, it does not allow of any growth in size or change of form. This difficulty is overcome by moulting the old cuticle and growing a new one in its place. Since the new cuticle is, at first, soft and pliable it adapts itself to changes in size and form. The caterpillars of butterflies and moths moult six to nine times; fly-maggots cast their skins only three times, the common cockroach moults seven times, while the nymphs of mayflies and stoneflies may cast their skin as many as 30 or 40 times in a life of nearly two years.

Once an insect becomes adult, all growth ceases, and it no longer moults. Small flies, for example, do not grow up into larger kinds—they belong to different species. Where growth involves evident changes of form such a change is termed metamorphosis. The lower forms of insect life, such as the springtails and the silver fish, change their form so little during growth that no metamorphosis takes place. Most of the lower insects, however, pass through direct or incomplete metamorphosis. This happens in cockroaches, earwigs, grasshoppers, plant-bugs, etc., and the young are very like their parents except for the absence of fully-grown wings. Such immature forms are known as nymphs. Mayflies and dragon flies all have aquatic nymphs that breathe mostly by gills and live in ponds or streams.

In the higher insects an indirect or complete metamorphosis takes place. This happens in butterflies and moths, beetles, flies, ants, bees, and wasps. The young are termed larvae and are so different from their parents that it seems incredible that the one grows into the other. When growth has been completed as larvae, the creatures change into a resting phase or pupa which, in butterflies, is known as a chrysalis.

It is during the pupal stage that the larval organs are completely disintegrated and new or adult organs are built up in their place. Thus the sluggish, leaf-eating caterpillar becomes the active nectar feeding butterfly or moth; the degenerate, legless grub of a wasp or bee becomes changed into the winged insect.

The adult insect is the imago: it is essentially for reproduction. After mating and egg-laying, the female insect usually dies.

The total life from the egg onwards rarely exceeds a year, and is often much shorter. Sometimes, however, two or more years are spent as a nymph or a larva, though it is rarely that adults live so long. The queen bee is an exception and is capable of living about seven years, while the queens of some ants live even longer.

SENSES AND BEHAVIOUR. Insects respond to touch or contact, light, smell, taste, and sound. It is probable that they do not feel, see, smell, taste, or hear in the same way as man, as their sense-organs are very different. Touch is experienced by means of innervated hairs that are especially

numerous on the antennae. The organs of smell are also chiefly located on those same appendages. Taste organs lie on the mouth-parts and in the mouth-cavity. Hearing is by means of a sensitive drum-like membrane on either side near where the thorax and abdomen join, as in many moths and grasshoppers. In other grasshoppers these drums, or tympana, lie on each fore-leg near the "knee joint."

No insect has a true voice: the most usual way of making sounds is by stridulation, *i.e.* the rubbing of one part against another, as in many moths and crickets. The sounds they make are a means of bringing together the members of the two sexes of a species, and the faculty of sound production is often present only in the male.

The compound eyes are specially sensitive to movements of objects and, since they have no focusing mechanism, their image-forming capacity is very limited. Insects have a sense of colour vision, and they are especially sensitive to the shorter light waves, including ultra-violet. They are mostly rather insensitive to red.

CLASSIFICATION. Insects are grouped into 24 major divisions or orders. The most important of these are:

Othoptera (Gr. *orthos*, straight; *pteron*, wing): cockroaches, grasshoppers, crickets.

Odonata (Gr. *odous*, gen. *odontos*, tooth): Dragon flies.

Neuroptera (Gr. *neuron*, nerve; *pteron*, wing): lacewings and their allies.

Hemiptera (Gr. *hemi*, half; *pteron*, wing): plant-bugs, aphids, and the like.

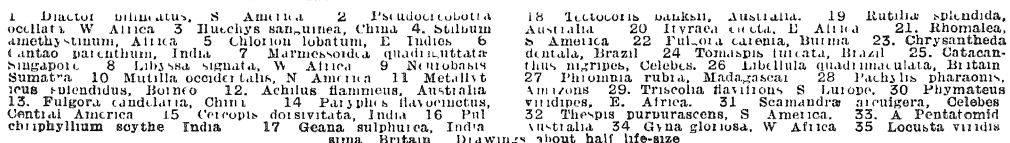
Lepidoptera (Gr. *lepis*, gen. *lepidos*, scale; *pteron*, a wing): butterflies and moths.

Coleoptera (Gr. *koleos*, sheath; *pteron*, wing): beetles.

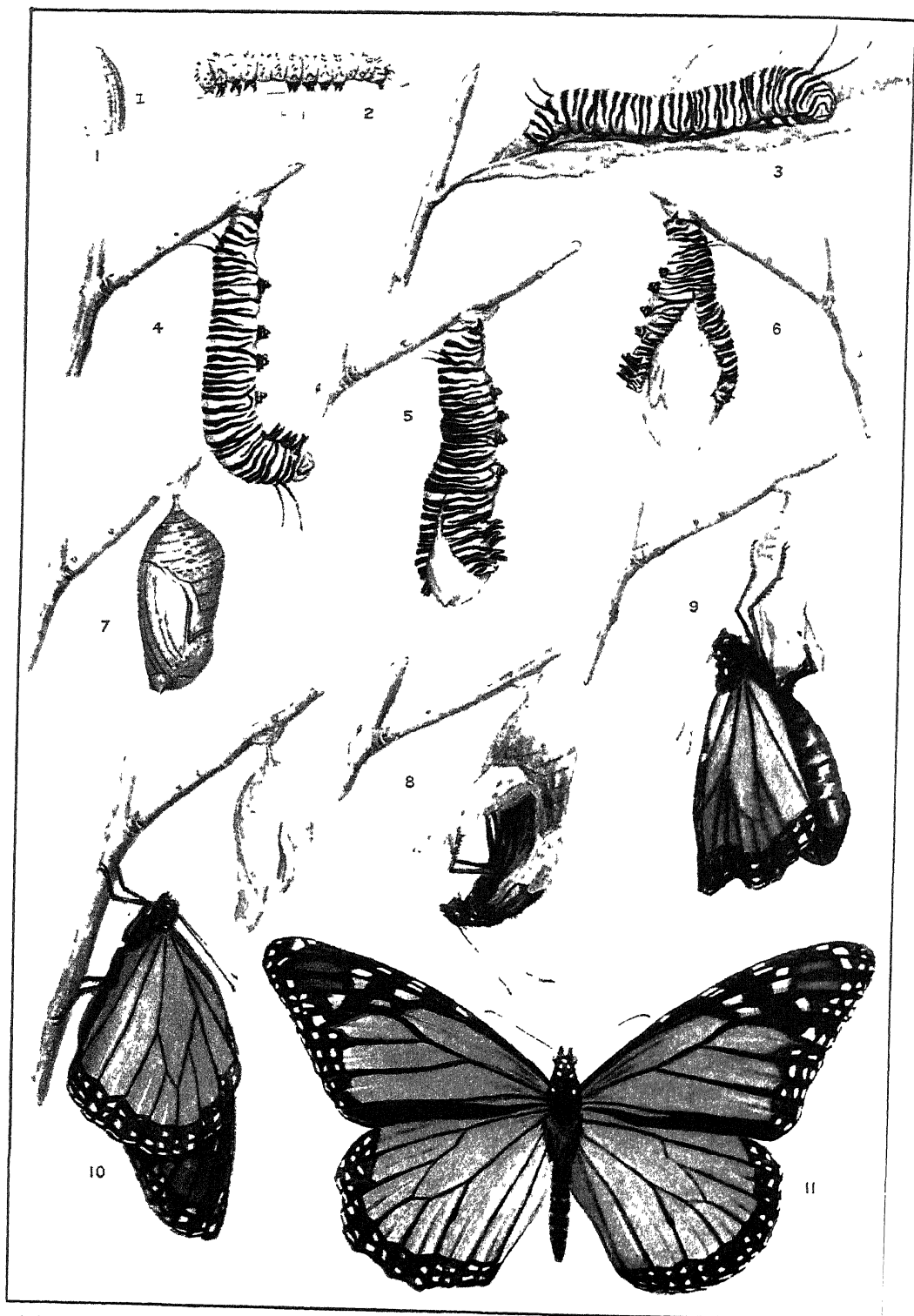
Hymenoptera (Gr. *hymen*, membrane; *pteron*, wing): ants, bees, wasps, ichneumon flies, etc.

Diptera (Gr. *di* two; *pteron*, wing): true flies.

ECONOMIC IMPORTANCE. Insects play a most important part in the economy of nature. They are found everywhere, and some species or other inhabit almost every kind of environment. Many species are injurious to human welfare. Such kinds either destroy or injure crops, fruits, stored products, timber, woollen goods, etc.; other kinds attack domestic animals; and a number of species directly affect man's own person.



To face page 4510



1 The egg. 2 Caterpillar at birth. 3 Full grown caterpillar. 4 Caterpillar hanging to a twig by its hind legs just before changing into a chrysalis. 5 Chrysalis beginning to emerge from its skin. 6 Chrysalis withdrawing from old skin. 7 Chrysalis. 8 Butterfly. *Danaus plexippus*, bicornis, the

chrysalis skin. 9 Butterfly freeing itself from chrysalis and expanding its wings. 10 Butterfly with wings drying after expansion. 11 The butterfly. The drawings are all life size, except in the cases of 1 and 2, where the actual sizes are indicated by scale lines.

INSECT BIRTH AND EVOLUTION OF A BUTTERFLY

These last include mosquitoes, fleas, lice, and midges, and are for the most part active blood-suckers; it is through this propensity that the organisms of certain virulent diseases are transmitted from man to man. In this way malaria is carried by the *Anopheles* mosquitoes, while other mosquitoes transmit the virus of yellow fever. The tsetse fly of tropical Africa is the carrier of the pathogenic organisms of sleeping sickness; the body louse transmits typhus; and certain fleas are carriers of the bacillus of bubonic plague.

Not all insects are injurious to man. The hive-bee, for instance, produces honey and beeswax; the silkworm yields silk and gut; the lac insect produces shellac; and the beetle known as the Spanish fly provides the drug cantharidin. Other insects are useful in that they prey upon and destroy noxious species. Many other kinds, and their larvae, are scavengers, while bees, moths, butterflies, and certain flies play an all-important part in the pollination of fruit-trees and other flowering plants.

Methods of controlling noxious insects may be grouped under three main categories: (1) chemical methods (*see* Insecticide); (2) cultural methods; (3) biological methods. Cultural control involves adapting methods of cultivation of crops so as to render them as unfavourable as possible to insect pests. The eradication of charlock and other weeds destroys the wild host of certain pests of cruciferous crops; an important method of protection against the frit-fly of oats is to sow as early as possible in the spring; and so on. Biological control involves the use or encouragement of other organisms in the repression of pests. Insectivorous birds and mammals should never be destroyed. Also, many insects, such as ichneumon flies, ladybirds and their larvae, and chalcid wasps, are important natural agencies in the control of noxious insects. In certain cases very successful results have been obtained by the transfer and colonisation of beneficial insects in countries where they did not previously exist.

Bibliography. Agricultural Entomology, D. H. Robinson and S. C. Jary, 1928; Natural History of Aquatic Insects, L. C. Miall, 1934; Principles of Insect Morphology, R. E. Snodgrass, 1935; Insect Pests of Glasshouse Crops, H. Miles, 1935; Insects of British Woodlands,



Insect and Insecticide. 1. U.S. agricultural helicopter spraying a D.D.T. compound over vast fields of wheat; it can cover about 150 acres per hour. 2. Small-scale insecticide spray. 3. Defoliation of a wood by gipsy-moth caterpillars

Photo No. 3, U S Dept of Agriculture

R. N. Chrystal, 1937; Pests of Fruits and Hops, A. M. Massee, 1937; Instructions for Collectors, No. 4a, Insects, J. Smart (British Museum), 1940; General Textbook of Entomology, A. D. Imms, 1942; Outlines of Entomology, A. D. Imms, 1944; Detection and Control of Garden Pests, G. Fox Wilson, 1947; Insect Natural History, A. D. Imms, 1947.

Insecticide. The name applied to any substance or mixture of substances intended to kill harmful insects. The term refers both to substances used for the control of insect pests on living plant crops, and to materials intended for the destruction of insect pests infecting man or other animals, houses, stored products, soil, fabrics, timber, etc., and for the prevention or reduction of such infestation. The serious losses in agricultural and horticultural crops due to insect depredations have led to the systematic study of economic entomology and the

chemistry and physics of plant protective materials. Legislative enactments have made insect pest control compulsory in certain circumstances, and standards of quality for most insecticides and fungicides have been set.

Insecticides are broadly classified into two groups, based on the feeding habits of the insects to be controlled. To destroy chewing or mandibulate insects (*e.g.* caterpillars, beetles) stomach poisons are spread over the foliage or other surface which the creature will eat; to destroy sucking insects (*e.g.* aphides) contact poisons are used: these come into direct physical contact with the insects and cause death by absorption through the body walls or by suffocation. Sucking insects usually insert their mouth parts into the leaf tissue and draw up the plant sap, instead of consuming the actual substance of the leaf. A stomach insecticide is therefore

of little value against a sucking insect. Contact insecticides are curative or eradicator, and stomach insecticides preventive or protective, in their functions.

A third type of insecticide consists of fumigants, in which the toxic material is applied as a gas and acts on the respiratory system of the insect. Some insecticides, however, fall into more than one group, and the mode of action of others is not always clearly understood.

The manner and time of application of insecticides is of great importance. They should be applied when they will not damage the host plant and when the insect is most vulnerable. Fruit-tree winter washes or ovicides, for example, are used when the tree is dormant and many pests are present in the egg stage, in which they can be more conveniently controlled than when, as emerging insects, they start causing damage. In the dormant stage the tree will tolerate stronger concentrations or more active insecticides than later in the year.

Various Forms of Insecticide

Insecticides are most generally applied as solutions, emulsions, or suspensions in water, or as finely divided powders, with an inert base as carrier. The means of application vary from large-scale, high-power spraying and dusting machines to the syringe and powder blower of the amateur gardener. Some insecticides are poisonous to man and animals, and stringent precautions must accompany their use. Auxiliary materials are frequently added to increase or facilitate the action of insecticides, such as spreaders, wetters, and penetrants to improve contact between the toxic material and the sprayed surface or the insect; stickers to increase retention and resistance to wind or rain; correctives to reduce harmful effects on the plant; emulsifying agents to disperse the toxic material in water, so that an even, but not excessive, film is deposited.

The principal insecticides are:

Stomach poisons: arsenicals (chiefly lead arsenate, against most chewing insects), fluorine compounds (in baits for cockroaches, ants, etc.).

Contact Poisons: tar oils (in fruit-tree winter washes), petroleum oils (in fruit-tree winter washes and, in purer form, in foliage sprays), nicotine (as spray, dust, or fumigant against a wide range of insects, particularly

aphids), pyrethrins (from pyrethrum flowers, in powder or extract form, against flies and domestic and horticultural pests), rotenone (from derris or lonchocarpus root, in powder, dust or extract form, against many insects), sulphur (elementary sulphur as vapour, dust, or spray, and lime sulphur solution against red spiders and scale insects).

Fumigants: hydrocyanic acid (for glasshouse and citrus tree fumigation), carbon bisulphide (against soil pests), organic halogen compounds (grain treatment).

Among other substances which have found use as insecticides in special fields are soaps, naphthalene, cresylic acid, quassia, organic sulphur compounds, aliphatic thiocyanates, and aromatic dinitroderivatives (especially dinitro-ortho-cresol, used in winter washes). Two synthetic organic compounds which have proved potent as insecticides are benzene hexachloride and dichlorodiphenyl-trichloroethane (*q.v.*) or D.D.T. See also Fungicide.

Insectivora (Lat., insect eaters).

Name for the zoological order of primitive mammals. Most of them are small, and nocturnal and terrestrial in habit. The hedgehog, mole, and shrew are familiar British examples. The body is generally covered with soft fur, though the hedgehog has spines, and the animals walk in plantigrade fashion by placing the sole of the foot on the ground. The molar teeth have small conical tubercles on the crowns, and there are always at least two pairs of lower incisors. The brain is of low type and small size, the skull being low and the facial region prolonged. These animals do not feed exclusively on insects. Moles eat worms; some of the arboreal species eat leaves as well as insects; and the amphibious Potamogale catches and eats fish.

Insectivorous Plants. Plants of several genera and families which have adapted parts of their structure to the catching of insects, whose soft parts are dissolved out and then absorbed by the plant for its nourishment.

Various observers had noted the presence of dead insects on these plants, and one species, Venus's fly-trap (*q.v.*), had long been cultivated

in greenhouses on account of the curious sensibility shown by its gin-shaped leaves; but until the publication of the researches of Darwin, 1875, chiefly upon the sundews, the true nature of these plants was not realized. Sundew (*Drosera*), butterwort (*Pinguicula*), bladderwort (*Utricularia*), and a few others procure at least the greater part of their sustenance by digesting and assimilating trapped insects. See Bladderwort; Bog Plants; Butterwort; Indian Cup.

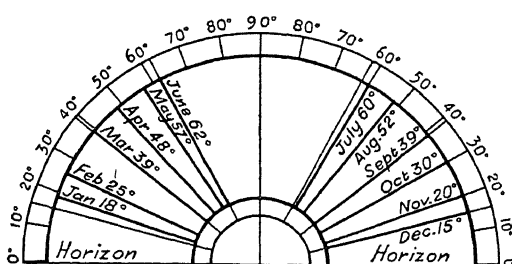
Inselberg (Ger., island mountain). Isolated rock hill standing above a flat plain, in regions of desert or semi-arid climate. They represent residual rock masses not worn away by the agents of erosion which levelled the surfaces on which they stand. They have often a distinctive dome or beehive shape, and are well-known features in parts of E. and S.W. Africa, Nigeria, Arabia, and W. Australia.

Insemination. A note on the use of Artificial Insemination is given under that heading. See also Reproduction.

Inshan. Mountain range forming part of the system which extends across the centre of China from the Hindu Kush to the Sea of Okhotsk. The Inshan Mts., which run S. of the Gobi Desert, are a western continuation of the Khyngan Range. To the S., beyond the Hwang-ho, is the desert plateau of Ordos. Height, 10,000 ft.

Insolation (Lat., *insolare*, to place in the sun). Portion of the sun's radiant energy received by the earth. The quantity received per day at a given place depends upon the angular height of the sun on that day, the transparency of the atmosphere, the distance between the earth and the sun, and the quantity of solar energy emitted on that day.

The intensity of radiation in the beam in free space at the mean distance of the earth from the sun is known as the solar constant and is equal to 135 kilowatts per sq. decametre of cross section. If the



Insolation. Aspect diagram depicting seasonal angle of sun altitude over London
By courtesy of "Specification"

atmosphere neither reflected nor absorbed solar radiation, the icy polar wastes would receive more insolation on a midsummer day than would the hottest regions of the earth in any 24 hours. Transparency of the atmosphere varies greatly, the passage of the sun's rays being impeded by water vapour, dust, and smoke particles; under the most favourable conditions only about three-quarters of the solar energy is transmitted. In high latitudes where the rays fall more obliquely, less energy is available for warming the surface of the earth and lower layers of the air. The arid regions of the trade wind belts with their clear skies can therefore be the warmest on earth. Insolation is generally more intense as altitude increases.

In architectural planning in northern latitudes the aspect chosen for a building depends partly on making the most of the sunlight receivable at that particular place. In domestic buildings the best rooms are arranged to have a sunny aspect, a living room facing S.W. to S.E. Larders, pantries, etc., should face N.W. to N.E. Only in houses standing alone is there complete freedom of choice, for in grouped houses even where the architectural plan is elastic, it is not always possible to arrange that each room shall have the aspect most appropriate to it. Below is a table of hours of possible sunlight per day for lat. 52° N., e.g. southern England.

hrs. mins.		hrs. mins.	
Jan. 8	29	July 15	57
Feb. 10	19	Aug. 14	5
Mar. 12	7	Sept. 12	7
Apl. 14	14	Oct. 10	22
May 15	55	Nov. 8	43
June 16	40	Dec. 8	2

Insolvency (Lat. *in*, not; *solvere*, to pay). Term used in English law. A debtor is said to be insolvent if he cannot pay his debts, as they become due, out of his own moneys. It is, therefore, quite possible for a person to have assets exceeding his debts, and yet be insolvent, because he cannot realize his assets. See Bankruptcy.

Insomnia (Lat. *insomnis*, sleepless). Inability to sleep. True insomnia is most frequently associated with disturbance of the nervous system, such as undue mental fatigue, neurasthenia, pain, worry, and organic changes in the brain itself. Treatment then consists in grappling where possible with the underlying cause. Pain is relieved by morphia, and when such pain is removed sleep ensues, morphia itself not being a real

hypnotic. The truly hypnotic group of drugs, such as the barbiturates, have a wide range of application. The approved method is to use them in generous doses under medical supervision until the cycle of sleepless nights is broken and the habit of sleep re-established. Some substances cause the patient to fall asleep; others are calculated to keep him asleep. Such drugs taken over a long period do, however, injure the mental and emotional powers of the patient.

An outraged liver is a common cause of insomnia; working overtime, it causes other organs, such as the kidneys, to do likewise, and the whole body is kept in tension. Wise diet and abstention from pork, milk, and fats, tend to cure insomnia thus caused. A simple cause of sleeplessness may be tea or coffee taken near bedtime. Small quantities of alcohol are a cerebral excitant; larger quantities are a sedative.

Remedies for insomnia include a hot bath, waist high; a hot drink, which draws the blood from an over-active brain; a simple alkali such as milk of magnesia, which prevents the "acid tide" of the chemistry of the later hours. People who declare they hear the clock strike each hour probably sleep between the striking of the hours, coming up to consciousness in time to hear the next hour sounded. If mind and body are relaxed, sleeplessness does not cause undue fatigue next day; it is tension brought about by the fear of not sleeping that causes this. See Sleep.

Hilary Ledgerwood, M.B.

Inspector-General. A former office in the British army. Upon the abolition of the office of commander-in-chief in 1904, the rank of inspector-general of the forces was created, the duke of Connaught being the first holder. The duties included technical reports on the state and adequacy of fortifications and coast defences. The office was abolished in 1915, the duties being taken over by the chief of the imperial staff.

Inspiration (Lat. *inspirare*, to breathe into). Word commonly used to denote a supernatural influence or agency acting upon the human mind for the purpose of creating literature, especially sacred literature, which embodies the revelation of the Divine truth and purpose.

The term is more particularly used in connexion with the Bible and with other forms of sacred

literature, e.g. the Vedas, Koran, Zend-Avesta, but in a wider sense it is employed to describe the divine afflatus of all great poets and writers. Plato, for instance, in his *Ion*, speaking of the poet, says: "there is no invention in him until he has been inspired and is out of his senses. God takes away the minds of the poets and uses them as His ministers, just as He uses diviners and holy prophets in order that those who hear them may know that they speak not of themselves when they utter their priceless words in a state of unconsciousness, but that God is the speaker and through them is conversing with us." But while belief in inspiration is universal, there is the utmost diversity of opinion with regard to its character and mode of operation, especially in the production of the Bible.

The Human Agent

The most extreme theory regards the human agent as the passive instrument of the Spirit. His own mental activity is for the moment suspended, and in a state of trance he becomes the medium through which the supernatural revelation is communicated. As Philo puts it, "His reason departs and yields up the citadel of the soul; the divine spirit enters and strikes at the mechanism of his voice"; or, as the early fathers of the Church used to say, the Spirit acts on just men as a plectrum on a harp or lyre, or as a flute player upon the flute.

A modification of this theory abandons the idea of a hypnotic trance as the condition which makes inspiration possible, but still maintains that, though the human reason is awake during the process, it is so mastered and overpowered by the action of the Spirit, that it becomes the conscious penman or amanuensis of God—with the result that the inspiration of the product is plenary and complete—so complete indeed that the *Formula Consensus Helvetica* in 1675 laid down the doctrine that it extended even to the vowel points and accents of the Hebrew text, and Dean Burgon claimed that every clause and every syllable of the Bible was divinely inspired.

This extreme theory of inspiration in both its forms has been compelled to give way before the pressure of modern scholarship. We know, for instance, the method by which the historical books of the Bible were composed, and this method is absolutely at variance with the theory of plenary inspiration. Far from being the dictation

of the Spirit, we know that the historical writings of the Old Testament, and the synoptic gospels in the New Testament, were laboriously compiled out of earlier sources. S. Luke, for instance, in the preface to his Gospel, tells us, not that he listened for some communication of the Spirit to come to him, but that he gathered up "the testimony of eye-witnesses and ministers of the word" and "traced the course of all things accurately from the beginning." Moreover, the theory of verbal inspiration leaves unexplained the many slight discrepancies in the different Bible narratives of the same event.

No theory of inspiration, therefore, is likely to prove tenable which eliminates the personality of the human agent and does not admit the cooperation of the human mind with the Divine Spirit. If we admit the necessity of this cooperation, there is still room for the utmost divergence of view as to how much in the act of inspiration is due to the activity of the Divine Spirit, and how much to the human recipient. One theory, for instance, holds that the truth revealed is due to Divine action, but the words in which it is conveyed are the work of the recipient. It is impossible to devise a formula which would give scientific expression to the distinction between the divine and human contribution in the act of inspiration. There are degrees of inspiration. No one would dream of putting the book of Ecclesiastes on the same spiritual level with the second part of Isaiah, or of ranking the epistle of Jude with the fourth Gospel. The communication of Divine truth is necessarily conditioned by the personality through whom that communication is made.

A Definition of Inspiration

We may take as perhaps the best account of inspiration in accordance with the findings of modern scholarship, the definition of S. R. Driver: "However difficult it may be to define inspiration, or to determine the mystery of its operation, those who use the term may be supposed probably to mean by it an influence which gave to those who received it a unique spiritual insight enabling them thereby, without superseding or suppressing the human faculties, but rather using them as its instruments, to declare in different degrees and in accordance with the needs or circumstances of particular ages the mind and purpose of God." A definition such as this would permit us to extend the principle of

inspiration beyond the limits of the books of the Bible, because the bestowal of a unique spiritual insight is not the exclusive privilege of the writers of those books.

Character and Quality

In what sense, then, can it be claimed that the Bible possesses an inspiration which exceeds anything that can be predicated of other literature? The answer is simple. The character of inspiration is to be measured by the quality of the revelation. The measure of the difference between the revelation of Divine truth in the Bible and in other sacred literature is the measure of the difference of the quality of the inspiration. Those who believe in the supremacy of the Divine revelation contained in the Bible will claim a unique inspiration for those through whom that revelation was made known to the world. See Bible; Criticism, Biblical; Gospels.

H. T. Andrews

Bibliography. Bampton Lectures on Inspiration, W. Sanday, 3rd imp. 1896; Revelation and Inspiration, J. Orr, 2nd ed. 1919; The Inspiration of God, R. Lloyd, 1944; Inspiration and Revelation in the O.T., H. W. Robinson, 1946.

Instar (Lat. *image*). Entomological term for the form assumed by an insect during any particular interval between succeeding ecdyses (moult). When an insect

hatches from its egg, it is in its first instar; after the first moult, in its second. The last instar is the imago (adult). Immature instars are larvae or nymphs according as their structure is fundamentally different from that of the imago or differs mainly in the absence of wings and reproductive organs.

Insterbürg. Town which was part of East Prussia until annexed in 1945 by the U.S.S.R. and renamed Chernyakovskiy, after a general killed in the fighting there. It is 57 m. E. of Königsberg (Kaliningrad), at the junction of the rivers Instar and Angerapp, which here form the Pregel. Insterbürg was founded by the Teutonic Order in the 14th century, growing up around their castle of Georgenburg. It was a manufacturing town, interested in leather, machinery, iron foundries, and spinning mills, as well as a trade in agricultural produce; also a railway junction. The chief buildings were the town church, a 17th century edifice, and a 14th century castle. In Aug., 1914, the town was occupied for two weeks by the Russians during their invasion of E. Prussia. In the Second Great War Insterbürg, first town of strategic importance on German soil captured by the Russians, fell to them Jan. 22, 1945. Pop. (pre-war) 41,230.

INSTINCT: FIXED BEHAVIOUR

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All living matter has what appear to be innate and ineradicable tendencies in activity. Here are considered the limits to which the term instinct can be properly applied. See also Animal Intelligence; Heredity; Psychology

The term instinct (Lat. *instinguere*, to prick, incite) has been used at different times to denote various concepts. It finds a place in psychology as applied to human beings, but there is no agreement among psychologists as to its precise significance, or as to how man's instincts should be classified. Fundamentally, the word refers to something which is thought of as an ineradicable tendency inherent in the organism under discussion. Perhaps the easiest organism to think about is a single virus particle, which is believed to be a single protein molecule whose behaviour consists in the acquisition from the environment of smaller molecules and atoms and in the arranging of these into replicas of itself. So far as we know, given this pattern to start with, and given the materials in the environment to be captured, and given the right con-

ditions of temperature and so on, the virus particle will go on doing this indefinitely—that is to say, its behaviour is fixed, inherent, or instinctive. If its structure is changed, for instance by mutation, we are then thinking about a different virus, which will behave differently because it is different.

In passing from the consideration of the behaviour of a virus to that of such an organism as a fertilised egg, we find ourselves considering a situation in which something new has appeared. The organism is no longer capable only of forming replicas of itself. It does this still, but it does something else as well; the genes in the chromosomes in the nucleus of the egg organize their environment as well as reduplicating themselves. Indeed, the egg we see is that part of the environment of these genes which they have succeeded in so organizing. We now have a

pattern—the genes—within a pattern made by them—the egg. The possibilities of behaviour of this outer, secondary, and derived pattern are immensely complicated and constitute in their realization the behaviour of the egg in development and of the developed adult with no break in continuity.

This continuity of development is important. It must be realized that so far we have considered the organism objectively, and discussed its behaviour just as we may discuss the behaviour of any object whether living or dead. It is open to us also to speculate about the subjective condition of the behaving organism. The continuity of development, however, does not provide us with any critical point at which we become justified in doing this suddenly. Either we may speculate on the subjective state of a virus and an egg, or we may not speculate on the subjective state of a man.

The name for the act of speculating about the subjective states of organisms is the study of psychology. The name for the act of examining the objective behaviour of certain organisms is the study of animal behaviour. Both these activities are genuine sciences, but they are different, and to confuse them darkens counsel. They are concerned, as it were, with two sides of a sheet of paper, and a sheet of paper has two sides, however thin it may be.

Effect of Environment

All animals live in relation to an environment. The very act of living presupposes surroundings, because living consists in using and acting upon these surroundings. For this reason changes in the environment are very likely to involve changes in the behaviour of the animal. If the environment changes the animal is likely either to have to start living differently or to stop living. This somewhat obvious fact is described in conventional terms by saying that the animal "responds to changes in the environment," or that it possesses "irritability." In those animals which are not divided into cells, known collectively as the protozoa, the responsiveness appears to depend upon the structure of the particular creature, and as the structure is upon a molecular scale or on a very small anatomical scale indeed, we are as a rule unable to alter it significantly without killing the animal. The slipper animalcule, for instance, whose scientific name is *Paramecium*, will swim away from water

that is too hot, and will swim towards some substances suitable for food. We cannot stop it from doing this except by killing it or narcotising it, in which latter case nearly all its behaviour is reduced or stopped. Since its reactions to heat, acids, and food are for practical purposes individually ineradicable, it seems proper to call them instinctive or inherent.

Physico-Chemical Changes

Turning now to animals which are divided up into cells, known collectively as the metazoa, we find that here there is an organization on a different scale. Some cells specialise in contracting, and some in conducting changes—almost certainly real physico-chemical changes—from one part of the organism to another. The contracting cells, or muscle cells, are arranged in an embryo in two rows, one down each side of the body. Contraction of these on one side makes the embryo curl that way. The conducting cells, or nerve-cells, are arranged in a tube down the embryo's back. In the embryo of an axolotl it so happens that the stages of development can be very easily followed, and it is found that the animal's behaviour gets more elaborate precisely as the distribution of nerves to the muscles gets more complicated. To begin with, there is only a single connexion from the front of each side of the animal's head to the muscles on the other side. At this stage a touch on the side of the head causes a contraction of the muscles on the other side of the body, so that the head is pulled away from the touched side. Later, there are connexions from the muscles on one side across the forward part of the nerve tube to the muscles on the other side, so that at this stage contraction of one set of muscles actually initiates subsequent contraction of the other set. In this way the head will be made to swing from side to side. This is an advance on the previous situation. Later connexions mediate the passage of waves of contraction down the animal's body. These waves follow each other on alternate sides, and this leads to a real swimming motion so that the animal progresses. This behaviour—this response—is instinctive. It inheres in the structure of the animal—in the relation of its nerves and muscles. Our ingenuity, however, enables us to eradicate it by severing nerves.

A great deal of the behaviour of animals, including the behaviour

of man, is mediated by just such structures and arrangements as have been here indicated. In insects and in many other forms it appears that virtually the whole of their response to their environment—their behaviour—is so mediated, and can be changed only by operative interference. It is what is popularly and quite properly known as instinctive. We draw our hands away from a hot plate because of an arrangement which is in kind similar to the arrangement which mediates the swimming of an axolotl, the extremely complicated behaviour of insects in building nests or making traps, and all those multitudinous activities carried through by animals of every kind, mechanically and without learning.

Behaviour of Insects

It is in this last phrase that the crux of the matter lies: "without learning." An insect will continue to carry out its inherent pattern of behaviour quite regardless of anything we may do to make such behaviour inappropriate. In the vertebrates, the group to which man belongs, and to a considerable extent in some other groups, e.g. the octopuses and squids, learning is possible because of a nervous arrangement which in a real sense stores experience. Persistent nervous patterns or constellations come into existence as a result of the reception by the animal of stimuli from outside. The presence of these patterns changes the possibilities of the animal's behaviour. It has learnt. These patterns are not inherent in the same sense as are the patterns which lead to our withdrawing our hand from a hot plate. We instinctively draw back our hand, but it is only the burnt child that dreads the fire. The moth never learns to dread the candle, because it has no means of forming new neural patterns.

It has long been customary to "explain" animal behaviour (including human behaviour) in terms of "instincts" each of which is taken to stand for a whole piece of behaviour generally named from the end to which that behaviour is considered to be directed. Thus it is common to speak of a "mating instinct" or the "instinct of self-preservation." So long as it is realized that such a way of speaking is a piece of picturesque teleology, no particular harm seems to flow from it. If, however, we allow such a phrase as "the mating instinct" to cover all we imagine about the subjective state of the animal whose behaviour we con-

sider to be directed towards mating as well as this behaviour itself, and proceed to ascribe qualities at will to the entity so erected, we are apt to find ourselves with an explanation more cumbersome than the facts with which we started. This means that we can do nothing more with our explanation than we could do without it. When this is so, it means that our science has been bad, that our entities have been fruitlessly multiplied.

Animal behaviour can be understood by observing the behaviour of animals from protozoa to man, and by relating it to structure and to environment, of which it is the result, and by describing our observations in terms which involve the fewest special concepts. This is science.

Bibliography. Forced Movements, Tropism, and Animal Conduct, J. Loeb, 1918; Animal Ecology, C. Elton, 1927; Anatomy and Problems of Behaviour, G. E. Coghill, 1929; Problems of Instinct and Intelligence, R. W. G. Hingston, 1934; Behaviour of Animals, E. S. Russell, 1934; Interviewing Animals, B. Schmid, 1936; The Orientation of Animals, G. S. Fraenkel and D. Gunn, 1940; Bulletin of Animal Behaviour (Institute for the Study of Animal Behaviour, London).

Institute of France. General title of the group of the five great learned societies of France. These are the Académie Française (*q.v.*); the Academy of Inscriptions and Belles-Lettres, founded by Colbert, 1663, devoted chiefly to the study of history and antiquities; the Academy of Science, founded by Colbert, 1666, divided into two main branches of mathematical and philosophical sciences; the Academy of Fine Arts, finally constituted as such in 1816, including painters, sculptors, architects, and music composers; and the Academy of Moral and Political Sciences, constituted in 1832, with members representing philosophy, legislation, jurisprudence, economics, and finance, etc. The total number of members of the Institute is 228, elected under presidential approval, and there are also honorary members and foreign associates.

The Institute was established by the law of Oct. 25, 1795, and had its first headquarters in the Louvre. Its home since 1806 has been in the Collège des Quatre Nations, on the Quai de Conti. It receives an annual grant from the state, and awards literary and scientific prizes, in particular the triennial Prix Osiris of 100,000 francs for a notable discovery or publication. It is not to be confused with the Institut Français

(*q.v.*), a French educational organization in London.

Institute of International Affairs, ROYAL. For details of this organization see International Affairs, Royal Institute of.

Institutes (Lat. *institure*, to establish). Term used for certain treatises on law. The best known are those of Justinian and of Coke. The former, an exposition of Roman law, compiled about A.D. 533 for the benefit of students, is apparently based on a similar work by the jurist Gaius. It gives an excellent idea of Roman law, and throws considerable light on the social conditions of the time. The juristical conceptions are advanced, and form the basis of a great part of the law of Western Europe to this day.

Coke's Institutes, 1628, is a compendious treatise on the whole body of English law of his day. Many modern authors have cast discredit on his work, pointing out that he lacked the faculty of consecutive thought and logical system; but however deficient Coke may have been as a theoretical jurist, his statements of the laws of England are of the highest authority; and the Institutes, always cited as *The Institutes*, are a classic. The first volume, which is the most valuable, is on tenures. It is frequently called Coke upon Littleton, as it is a commentary upon the older work of Littleton on tenures. The second volume deals with Acts of parliament. The third is a treatise on pleas of the crown; and the fourth treats of the courts of the day.

Institut Français. A French educational organization in London. Founded in 1910 under the auspices of the university of Lille, it was at first known as the Université des Lettres Françaises. In 1945 it was handed over by the administration to the French government. Classes are held and lectures are given by the French university graduates who form the staff, and there are other cultural activities, the purpose being to foster understanding between Great Britain and France. The headquarters are at Queensberry Place, S.W.7, where an excellent French library is open to members.

Institution. Term in ecclesiastical law for the formal investiture, in church or cathedral, of a clerk in holy orders, after presentation by the patron and approval by the church council. The bishop invests him with the spiritual functions of a benefice and commits to his charge the care of the

souls of the parish. Upon institution the clerk may enter on the parsonage house and glebe and receive the income, but he cannot let them or bring an action for them until after induction (*q.v.*), which usually follows immediately upon institution.

Institutional Church. Name used for a church which possesses activities not traditionally associated with church work, *i.e.* social, philanthropic, and educational work of various kinds. The term is said to have been given first to Berkeley Temple, Boston, and the movement originated certainly in the U.S.A., where an Open and Institutional Church League was founded in 1894, and where there are many churches of the kind. Schools and colleges are attached to some, and provision is made for amusements. The movement spread to nearly all denominations. In Great Britain it spread less rapidly, although in a sense almost all churches are institutional in that they have activities beyond the holding of religious services. A prominent example was Whitefield's Tabernacle, Tottenham Court Road, London.

Institutum Divi Thomae. Graduate school of scientific research of the Athenaeum of Ohio, U.S.A. Founded in 1935, it was devoted to assisting in the war effort in 1942-45, but has been reconverted to a peace-time schedule of research and training. The principal laboratories of the school are in Cincinnati, with a series of subsidiary laboratories engaged in research throughout the U.S.A.

Instone, SIR SAMUEL (1878-1937). An English business man. Born at Gravesend, Aug. 16, 1878, he founded and became chairman of the shipping firm of S. Instone and Co., Ltd. He was also chairman of iron and coal concerns and, after starting the first regular London-Paris air service in 1919, became a director of Imperial Airways in 1924. Knighted in 1921, he died Nov. 9, 1937.

Instrument of Government. Name given to the constitution under which England, Scotland, and Ireland were governed from Dec., 1653, to May, 1657. After the failure of Barebones's parliament the country was without any regular government, except that of Cromwell, the lord general, and the council of state. To provide one, Lambert and other officers drew up a constitution which, with some alterations, was accepted by Cromwell.

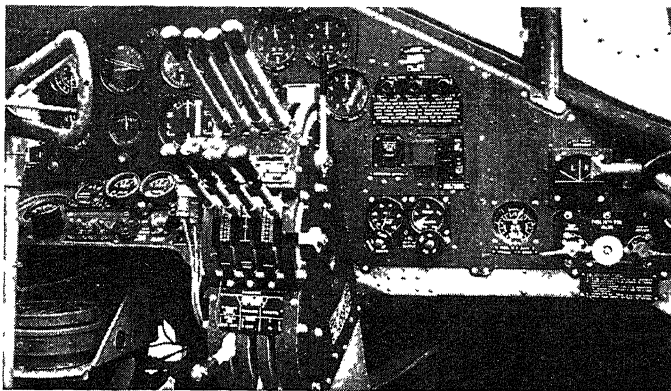
The Instrument consisted of 42 articles. It appointed a lord protector and a council of state, its members numbering from 13 to 21. Elaborate arrangements for electing new councillors were provided; they were chosen for life. It was decided that a parliament should meet on Sept. 3, 1654. This would consist of a house of commons only; 400 members being returned by England, and 30 each by Scotland and Ireland. It was a reform measure, as more members than heretofore were sent by the large towns. The parliament was to meet once in every third year, and could not be dissolved for five months. It could legislate freely, the only thing the protector could do being to delay such legislation for 20 days. Roman Catholics were disfranchised. The protector was given power to raise revenue and to maintain an army and navy. The consent of parliament was necessary to the appointment of high officers of state.

The parliament met, but difficulties with Cromwell soon developed, the members criticising the Instrument, and in five months it was dissolved. A second parliament was called in Sept., 1656. This drew up the Humble Petition and Advice which took the place of the Instrument. Although a failure, the Instrument occupies a prominent place in the history of constitutional theory.

Instrument Panel. In aeronautics, the assemblage of instruments which are provided to assist the pilot. It is usually fitted with instruments of three classes: (1) those to assist in the handling of the aircraft itself; (2) engine instruments; and (3) navigational instruments.

In an aeroplane the first-named normally includes altimeter or height indicator; air speed indicator, showing the speed through the air of the aircraft; turn and bank indicator; artificial horizon; and rate of climb indicator (statoscope). An automatic pilot (*q.v.*) is often fitted.

The instruments of the second class vary according to the type of engine in use. A revolution counter (tachometer) showing the speed of the engine, and a petrol gauge or gauges showing the amount of fuel remaining in the tank, are essential. In addition, a fuel pressure gauge, oil pressure gauge, and boost gauge (if a supercharger is fitted) are normally included for each engine. The navigation is based on a compass



Instrument Panel. Arrangement of panel in heavy bomber showing the multiplicity of navigation and engine indicators

and the gyroscopic flying instruments, with the aid of radio and/or radar (*q.v.*) and often of blind landing equipment.

Insubres. Celtic tribe who settled in ancient Italy in Gallia Transpadana. They inhabited the district between the river Ticinus and lake Larius (lake of Como), and their capital was Mediolanum (Milan). The most powerful Celtic tribe in Italy, they were defeated by the Romans in 197 B.C. and finally submitted after the fall of Comum in 196. *Pron.* Insu-breez.

Insulation (Lat. *insula*, island). The isolation of a body or structure against the passage of heat, sound, vibration, or electricity. The term is applicable equally to the method employed, and to material interposed to impede the movement of, if not wholly to confine or exclude, the free energy. In practice, thermal insulation is described as lagging, sound absorbent measures and substances as deadening, and anti-vibratory devices as damping or isolating units; while in electrical insulation the material used is termed a dielectric.

Insulation against sound is achieved by methods which absorb the wave energy of the movement, or break up the waves into innumerable smaller parts. The materials may have a cellular structure, or be of an elastic nature; or both these qualities may be combined in the same material. In the case of heat insulation the conduction of energy is hindered by the cellular or compartmental nature of the insulating medium, or by its comparatively inert nature; in some materials the ability to reflect heat rays is also utilised. Insulation against vibration is effected by interposing an elastic substance to absorb and damp out the

vibrations. The medium may be a liquid one, to which the unwanted movements are imparted by a piston connected to the vibrating member. An example is the oil dash-pot used to damp out the vibrations of the pointer of a weighing machine. Electrical insulation opposes a non-conducting barrier to the current.

Still air is used extensively in both lagging and deadening, though not with maximum efficiency in cavity walls and double windows, owing to the large air spaces and insufficient sealing. Lagging materials, necessarily low in heat conductance, are preferably incombustible as well as chemically inert, and neither hygroscopic nor likely to harbour vermin. Insulating efficiency depends largely upon the stillness of the air held within a multiplicity of minute cells in the texture of the material; and, to a lesser extent, upon the heat reflecting property of the walls bounding the cells. In practice some degree of diathermancy (transmission of radiant heat) is unavoidable, and best results are achieved by a smooth, polished surface to minimise radiation from the covering.

Granulated cork and powdered or fibrous materials such as diatomaceous earth, magnesia, asbestos, mica, and slag wool may be loosely packed into rigid compartmented casings; or mixtures of these, together with added plaster or other adhesive, may be wetted and applied as a paste, with or without wire reinforcement. Alternatively, such material may be preformed into slabs for lining cold stores and heat-treatment ovens, moulded to rigid shapes to suit pipes and fittings as in Fig. 1, or packed into compartmented canvas casings to form sheets and strips of quilting for use as in

Fig. 2. The thickness of such coverings, normally from 1 in. to 2 ins., varies directly with the higher temperature involved

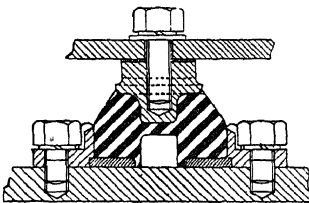


Insulation. 1. Preformed sectional pipe covering of glass silk, magnesia, asbestos, etc.

and/or the desired difference of temperature between the inside and outside of the covering. Glass silk, used extensively for temperatures below 900° F., derives its unusually high efficiency from the polished surfaces of the fibres forming the essential air cells. This is not applied as a paste, but is widely used as in Figs. 1 and 2, and is the most effective material for domestic frost precaution, when it is used in canvas-backed strips as shown in Fig. 3.

Many of the materials used as lagging, notably glass and other quiltings, are used for sound insulation, as well as sound absorbent plasters and deadening partitions of fibre board of cellular eel grass and wood wool. The lining of the inside surfaces of external walls with $\frac{1}{2}$ -in. thick fibre board materially reduces both outside noise and sun heat in summer, and also effects appreciable fuel economy in winter by reducing heat loss.

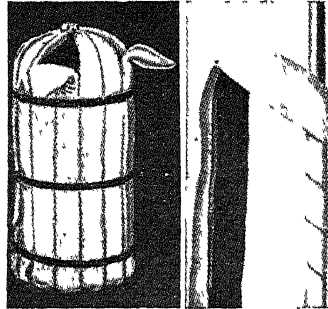
The damping-out of vibration requires an elastic medium in which the free energy may be dissipated by the internal friction



Insulation. 4. Compression type rubber and metal anti-vibration pedestal (rubber shown striped)
T. B. Andie Rubber Co., Surbiton

and resilience of the cushion. Light movement from an electric motor or ventilating fan can be countered by a sandwich of concrete and felt in a concrete base. Heavier units, particularly reciprocating and impact machines, are more effectively isolated by anti-vibration mountings of rubber bonded to metal as seen in Fig. 4. Lighter pedestals of similar construction are used to protect delicate instruments.

ELECTRICAL INSULATION. To isolate an electrical conductor from earth or from another conductor at a different potential, a so-called non-conductor, or insulator, of electricity, *i.e.* a material whose electrical resistance is extremely high compared with a conducting body, is used. The term insulator is loosely applied to any support or bushing of porcelain, glass, plastic, and the like; examples in common use



Insulation. 2. Higson Eeto jacket for hot water cylinder with hoop iron girdles. 3. Right, canvas-backed glass silk strip as used to protect water pipes against frost

vary from the small porcelain insulators used on telephone lines to the large strings of insulators used on grid lines.

The majority of non-metallic bodies are non-conductors of a sort, but not all possess the properties necessary to a successful insulating material. In addition to high resistance, such a material must withstand high temperatures, and also temperature changes, and must have high puncture strength (resistance to internal breakdown under high electric stress either continuous or suddenly applied) mechanical strength, durability, low moisture absorption, flexibility, and freedom from tracking, *i.e.* the formation of a conducting path of carbonised material due to local heating caused by surface leakage.

Oil is a very good insulator, but is suitable only if the object to be insulated can be immersed in it. Solid insulators include rubber, cotton, silk, paper, slate, marble, glass, porcelain, bitumen, wax, wood, and a variety of plastics ranging from bakelised paper to nylon. High-tension cables are wrapped with paper which, on account of its absorption of moisture, must be impregnated with oil or a bitumen compound, sheathed in lead and carefully sealed at all joints. For low-voltage cables rubber, a number of

rubber-like synthetic compounds, and varnished cambric are used. Wires for coil or armature winding are lapped with cotton or silk; have a coating of high-quality enamel, or a combination of enamel and silk or cotton; or with spun glass fibre, which withstands higher temperatures and thus makes it possible to produce more power from a motor of given size. Since glass fibre, like asbestos, absorbs moisture, it must be impregnated with a varnish, and this limited working temperatures until a varnish prepared from the important chemical family known as the silicones (*q.v.*) proved resistant to temperatures very much higher than the boiling point of water. See Cable; Conductor; Dielectrics.

Insulin. Substance secreted by tiny groups of cells, known as the islets of Langerhans and located in the pancreas. This secretion, isolated in 1922 by Banting (*q.v.*), controls the amount of sugar in the blood; its precise action is not understood. Extracted from the pancreas of animals, in particular sheep, it is used in the treatment of diabetes (*q.v.*) by injection, the dose being calculated according to individual requirements. It is manufactured under licence, and is available as soluble insulin, a water-clear fluid which circulates quickly and acts strongly, but whose action is of short duration; and as protamine zinc insulin, a milky fluid made by the addition to soluble insulin of protamine from fish roe and traces of zinc, the action of which is slower but more lasting. An overdose of insulin causes hypoglycaemia (*q.v.*).

The adrenal glands and the islets of Langerhans work in harmony, and an injection of adrenalin causes a flow of insulin, while an injection of insulin stimulates the output of adrenalin.

Insull, SAMUEL (1859-1938). United States financier. Born in London, Nov. 11, 1859, he went to America in 1881, and was private secretary for many years to Edison. He promoted and managed a number of companies, chief of which was the Insull Utility Investment Inc., and became one of the world's leading financiers; but in 1932 had to flee to Europe to avoid arrest on embezzlement charges. He was extradited from Greece in 1934 at the request of the U.S. authorities and stood trial in Chicago, being acquitted after eight months in the dock. He died in Paris, July 18, 1938.

INSURANCE: LIFE, MARINE, FIRE, ETC.

Sir Edward Mountain, Chairman 1917-48, Eagle Star Insurance Co.

A history of the practice of insurance, and an account of the different covers that can be effected through companies and societies. It is followed immediately by a separate article on National Insurance.

For war insurance see under War Damage

Insurance, or assurance, is a device by which a group or a corporation, called the insurers, undertakes to cover the risk of pecuniary loss arising from death or personal injury, or from the destruction of, or damage to, property, owing to perils of any kind to which an individual or group (the insured) may be exposed. This service is undertaken in consideration of the payment of an appropriate premium, either in a single sum or by periodical payments.

The essence of the transaction is that losses, whether inevitable or problematical, are transferred to the shoulders of other parties whose business it is to undertake and average a large number of similar transactions and who, by reason of the broadening of the basis, are able to sustain such losses with equanimity. In other words, when a claim arises, to quote one of the earliest English statutes relating to marine insurance, "there followeth not the undoings of any man, but the losse lighteth rather easilie upon many, than heavilie upon fewe."

Assurance and Insurance

"Assurance" is applied more particularly to life contracts and "insurance" to marine, fire, and miscellaneous risks; but there is no clear distinction between the use of the two terms. It is important, however, to recognize the fundamental difference between a life policy and a policy relating to one of the other forms of insurance. The life policy is concerned with an event which is bound to happen, and in regard to which a claim must eventually fall upon the insurers, while in nearly all other forms of insurance no claim need arise, the contract being an indemnity protecting the policy holder against loss if and when the contingency insured against should materialise.

A further important difference is that a life policy is not a contract of indemnity, like a fire, marine, or accident insurance, but a contract to pay a certain sum on the happening of a stated event. Hence there is no legal limit to which a person may insure his own life.

All insurance contracts are based on the legal doctrine of *uberrimae fidei*—that is to say,

the utmost good faith must be shown on both sides. Misrepresentation or omission to state a material fact when proposing a risk voids the contract.

The insured has no right of claim against his insurers unless he has an "insurable interest." This means that the happening of the event insured against must prejudice his interests or its not happening be of benefit to him.

History of Life Assurance

One of the earliest records of the science of life contingencies is John Graunt's *Natural and Political Observations on the Bills of Mortality*, 1662. This contains a rudimentary attempt to give what is now known as a mortality table, a table showing the numbers surviving at successive ages out of those born.

By the end of the 17th century the issue of policies dependent on human life had become of some commercial importance, for in *The Compleat Compting House*, by John Vernon, 1678, it is stated, "Other assurances are made upon the lives of men and women at a rate that is moderate; for by this means, if you buy any place or office that is worth £1,000 or more or less, and if you have not money enough to purchase it you borrow £400 or £500; now if you die and are not in a condition to pay this money it is lost; but if you insure your life, then your friend that you did borrow it of will have his money honestly paid him." The transactions referred to were no doubt assurances for temporary periods such as might be required to protect the policy holder against the perils of travel or other risks arising during a limited period, and there is nothing to suggest that policies familiar at the present time, running for the whole of life and subject to annual premiums, were known at that date.

In the *Transactions of the Royal Society* for 1693 there is a paper by Edmund Halley, *An Estimate of the Degrees of the Mortality of Mankind* drawn from various *Tables of Births and Funerals at the City of Breslau*, with an attempt to ascertain the price of Annuities of Lives. In the first half of the 18th century other works dealing with life annuities

and assurances followed, among them De Moivre's treatise on *Annuities on Lives and Reversions*, 1725, and Thomas Simpson's work *The Doctrine of Annuities and Reversions*, 1742.

In the meantime companies had been formed in England having amongst their objects the granting of benefits dependent on life. Thus in 1698 an institution was established by the Mercers' company in London with the object of granting life annuities to widows of members; while in 1699 a similar association, the society of assurance for widows and orphans, was formed. Both associations enjoyed a very brief existence.

The Hand-in-Hand company was founded in 1696. In 1705 the Amicable Society for a perpetual insurance office was formed, while the London assurance corporation and the Royal Exchange assurance corporation, 1720, for transacting marine insurance, shortly afterwards began to issue life policies.

Whole Life Policies

The Equitable assurance society contained the first germ of life assurance as now practised. This company started business in 1762 and speedily recognized the fact, previously overlooked, that the premiums payable by policyholders must depend on the age of the life insured. Moreover, subject to the payment of periodical premiums to the office, it granted policies for the whole duration of life, and not merely for limited periods. The premiums originally charged by the Equitable society for whole life assurances were, up to about age 40, double the rates now quoted by many offices—and experience soon showed that rates could safely be reduced.

A growing practice of effecting speculative policies received a check by the passing of the Life Assurance Act, known as the Gambling Act, in 1774. This Act provided that no assurance should be effected unless the person in whose favour the policy was taken out had a pecuniary interest in the life to be assured.

Between 1800 and 1843 about 150 new life companies were established, between 1843 and 1870 another 340. The passing of the Life Assurance Companies Act, 1870, with its provision for deposit, checked this multiplication of companies; and fewer than 50 of those formed before 1870 retained an independent existence into the middle of the 20th century.

LIFE ASSURANCE. In the U.K. life assurance is divided into two categories: ordinary and industrial. Ordinary life assurance is without limitation as to amount, and involves in most cases payment of a premium yearly. Industrial assurance, on the other hand, is subject to limitation of amount in the case of children, and premiums, often a few pence, are collected weekly or monthly at the policy holder's home.

Life assurance in Great Britain is effected by two types of institution, limited liability companies, in which shareholders take about 10 p.c. of the profits, and mutual societies, in which all profits are divided among with-profit policy holders. They are subject primarily to the provisions of the Assurance Companies Acts, 1909 onwards—legislation which now regulates the conduct of insurance business generally, but originally applied particularly to life business. Important sections of the Act of 1909 provide for: (1) separation of the life fund from the institution's other funds; (2) the preparation of a revenue account and balance sheet in prescribed forms at the end of each financial year; (3) periodical investigation at least once in every five years into the financial position of the life department of the institution, to be made by a qualified actuary, and submission of full details of the valuation in certain schedules appended to the Act; and (4) compliance with certain requirements designed for the protection of policy holders in the event of the winding up of the institution or its amalgamation with another. There was formerly a statutory obligation, which was abolished in 1946, to deposit £20,000 with the high court in respect of each class of business handled. In Canada, no one may act as an insurance agent or broker without being licensed.

Industrial Assurance

Industrial assurance is carried on in the U.K. by 15 companies and about 150 collecting societies. In its origin a method of provision for funeral expenses, it came to be more accurately regarded as an important form of thrift among weekly wage-earners. At the end of 1943 there were over 90,000,000 policies in force, and policy-holders' funds amounted to nearly £500,000,000. Nowadays industrial life offices generally deal also with ordinary life business.

The principal classes of life assurance are: (1) whole life—

the sum assured being payable on the death of the assured; (2) endowment—the sum assured being payable at a given age, or at the end of a fixed term of years, or at earlier death; (3) short term—the sum assured being payable only in the event of the life assured dying within the specified number of years for which the insurance is effected, (4) convertible term—a short term carrying with it the right of conversion at any time, before the expiration of the term, to a whole life or endowment assurance (with or without profits), without further evidence of health, on payment of the premium for the age at the time of conversion. A popular form of assurance called the family or income benefit policy combines whole life or endowment assurance with short term cover and assures, in addition to a capital sum, a quarterly payment until the end of a stated period, usually 20 years from the inception of the policy. By this means, a young married man can, at an economical cost, assure for his widow both a principal payment and an income payable during the most difficult years, should he die prematurely.

Deferred Assurances

House purchase is frequently arranged through the medium of an endowment assurance on the life of the purchaser, the policy being assigned to the mortgagor and the sum assured being applied to repay the mortgage advance at maturity or at the borrower's earlier decease. Children's deferred assurances and policies designed to cover the cost of a child's education are other forms of assurance which include life cover.

Both whole life and endowment assurance policies can be effected on either a non-profit or with-profit basis. Conditions vary somewhat, but surrender values, generally at least one-third of the total premiums paid, are allowed after the payment of three years' premiums in the case of a whole life policy and two years' in the case of an endowment assurance; or the policy can be converted into a paid-up policy. A loan can usually be obtained from the institution at the current rates of interest up to 95 p.c. of the amount of the surrender value. Thirty days are allowed for the payment of renewal premiums.

Most policies are free from restriction as to foreign residence or travel and occupation of the

assured once they have been issued. Under the Income Tax Acts of the U.K. policy holders are entitled to a rebate from their income tax in respect of life premiums, subject to certain limitations (*see* Income Tax).

Life assurance has been adapted to cover pension schemes promoted by firms on behalf of their employees. Group life pension schemes were first promoted in the U.S.A. and introduced from there into the U.K., and were underwritten by many British offices, who later developed other forms of pension schemes.

MARINE INSURANCE. This is much older than life assurance, having been transacted in some form in the ancient world. The earliest recorded use of the term marine insurance was in 1310 when the court of Flanders permitted the establishment in Bruges of a chamber of assurance, "by means of which the merchants could insure their goods exposed to the risk of the sea or elsewhere on paying a stipulated percentage."

This class of insurance was probably established in England considerably before the 15th century, but the earliest English policy of which record exists is one dated 1613 on a ship called the Tiger.

John Vernon, writing in 1678, describes the manner in which goods and merchandise carried by ship could be insured, and how in the event of loss at sea the amount payable could be insured.

The Beginning of Lloyds

Lloyds, now known all over the world for its dealings in marine insurance, dates from the late 18th century. The earliest English companies to transact marine insurance were the London Assurance and the Royal Exchange corporations, both formed in 1720. The Alliance Marine and General company was formed in 1820, the Indemnity company in 1824.

The need felt throughout the 19th century for a code which would embody the various judgements on the subject found expression in the Marine Insurance Act, 1906, which set the standard for British marine insurance. The Marine Insurance (Gambling Policies) Act, 1909, was intended to stamp out dealing in wager policies, *i.e.* policies where there is no insurable interest.

The business of marine insurance can be divided into two main classes, *viz.*: (1) the insurance of the body of the ship and of the owner's other interests; and

(2) the insurance of the cargo. In the first class the owner insures the hull or, in the case of a steamer, the hull and machinery, against marine perils, and in addition insures his freight payable at destination and his disbursements. There are various standard forms adopted to meet his requirements, the operative clauses being known as the institute time and voyage clauses.

Hulls are insured for twelve months on the basis of certain limits for trading which are known as institute warranties, additional premium being paid when these limits are exceeded. Twelve months is the usual period also for the insurance of freight and disbursements.

Insurance of Cargo

There are two recognized forms of insurance of cargo. The older form is known as f.p.a., i.e. free of particular average. Under an f.p.a. cover, the underwriter does not pay for damage sustained by the goods unless the vessel has been stranded, sunk, or burnt, or the damage has been caused by collision or explosion or can reasonably be attributed to fire. This clause has been elaborated considerably, and the policy now covers the risk from warehouse to warehouse, as well as the loss of goods in transshipment and damage owing to discharge through the vessel's putting into a port of refuge. The policy also pays general average, salvage charges, and, of course, total loss. The other form is known as a with-average policy. Under this policy the underwriter pays claims for damage from a sea peril if the claim amounts to a stipulated percentage, known as the franchise, the usual percentage being £3 per £100, on each package.

FIRE INSURANCE. In a primitive form, fire insurance was in operation centuries ago, examples of taxes comparable with fire insurance premiums having been traced in the records of pre-Christian Rome, and in other early Mediterranean communities. As regards England, levies for the benefit of members suffering fire damage were commonly made by the guilds and corporations of medieval times, and fire insurance contracts were undoubtedly issued long before the Great Fire of London; but it was not till that disaster had drawn attention to the need for providing against loss through fire that fire insurance became popular. The Fire Office, established at the Royal Exchange

soon after the fire, undertook the insurance of houses at a premium of 2½ p.c. of the yearly rent for brick houses and 5 p.c. for frame houses. Some years later an office known as the Friendly Society set up in competition with the Fire Office. The Hand-in-Hand, the General Insurance Office, and the Charitable Organization are other names associated with the early history of fire insurance; the last-named undertook the insurance of household goods, not previously insurable.

The formation of the Sun Fire Office in 1710 and of the Union in 1714 inaugurated an era of rapid expansion in fire insurance business, and hundreds of new fire offices were established in the next 200 years. Some of these survive under their original names, some have been wound up, and many have amalgamated with one another.

The good faith which is the essential feature of fire insurance contracts implies that the proposer shall not merely disclose all the facts needed to enable the insurer to estimate the risk, but shall keep his insurers informed if anything is done to increase the risk of fire after the contract has been agreed. Failure to observe these requirements violates the policy.

Standard Fire Policy Form

Most fire policies issued in Great Britain are drafted on the standard fire policy form agreed on by the offices in 1923. The use of this form has resulted in a uniform cover and conditions and eliminated many of the difficulties which were apt to arise before the introduction of the form, whenever a number of different policies had to contribute to reimbursement of the same loss. The standard fire cover excludes fire caused by spontaneous fermentation or heating, war, riots, civil commotion, and military or usurped power; but includes damage caused by lightning, and explosion of boilers or gas in domestic use.

Fire policies can be issued subject to average or free of average. In the first, if, when a loss occurs, the property is found to be under-insured, the insured is regarded as being his own insurer for the difference between the actual value and the sum insured and has to bear a proportionate share of the loss. Thus, if there is an insurance for £1,000 on property worth £2,000, and the policy is subject to average, the insured loses £1,000 in the event of a total loss; while, if the loss is a partial one of £500, he shares

the risk with his insurers in the same proportion and receives only £250. If, on the other hand, there is no average clause in the policy, he recovers the full amount of the loss up to the sum insured, and is penalised only when the loss exceeds his sum insured. Average is included in British fire policies particularly where the property insured is spread over two or more locations.

Varying Rates for Fire Risks

The rates for fire insurance are based on the loss experience of the insurers in the various classes of risk and range from 1s. 6d. p.c. for the building of a private dwelling to £5 5s. p.c. for textile waste mills. For many industries, most companies charge the same premiums, by mutual arrangement, but some risks are rated independently according to the individual experience of the company. For industries rated by the pooled experience of the offices, additional charges to the normal rate are made for bad features in a particular risk, while discounts are given for good features such as sprinklers and fire extinguishing appliances.

Insurance consists essentially in the distribution of the incidence of loss, and as the possibility of a disastrous conflagration must always be faced the insurers fix limits for all classes of risk. When a company accepts an insurance for an amount exceeding its limit the excess amount is reinsured.

Reinsurances, which are arranged in connexion with all types of insurance business, are arranged under two main headings: by treaties with various reinsurers who are bound to accept stipulated proportions of all insurances ceded to the group; or by facultative arrangements, under which the reinsurers are at liberty to accept or decline the risk offered. It is not unusual for a company to pay its assured as much as £100,000 yet not lose itself more than £5,000, recovering the balance from its reinsurers.

Fire insurance practice has undergone many striking developments in the 20th century. Loss of profits and consequential loss following fire are now almost invariably insured, while fire policies are frequently endorsed to include cover against riots, aircraft, explosion, and water damage; sprinkler leakage policies are also issued by the fire departments of the insurance companies. Further, adjustable and

declaration policies, providing for fluctuating amounts at risk, are issued for the convenience of those owning stocks whose extent and value are subject to variation. From the fire departments also come the popular comprehensive policies for private houses; and some offices issue similar policies covering a variety of risks for schools, boarding-houses, hotels, and retail shops.

Some indication of the scope of fire insurance is given by the returns of the insurance companies in respect of property in the L.C.C. area, the total sums insured amounting in 1943 to £2,341,946,143. The fire premium income of the offices for 1944 exceeded £68,000,000.

The operations of the British fire offices are world-wide, and their reputation for integrity and stability has preserved their foreign business for them through all the troubles and difficulties of the present century. Possibly as much as 60 p.c. of the fire premium income of British insurance companies comes to them from abroad.

OTHER INSURANCES. Accident insurance is of comparatively recent growth, and has expanded rapidly. In 1870 there were only six or seven companies transacting accident business and the total premium income did not exceed £250,000; there are now over 100 companies and the total premium income in 1943 was over £50,000,000, excluding motor business. Workmen's compensation business (the premium income from which amounted to more than £16,000,000 in 1943) ceased to be handled by companies under the National Insurance (Industrial Injuries) Act, 1946.

Burglary Insurance

Burglary insurance covers the insured against burglary, house-breaking and, in some cases, larceny. "All risks" policies insure specified articles, usually jewelry, furs, and other valuables, against loss from any cause. Goods in transit can be insured against theft and damage, and livestock against death and also for special risks such as foaling and service. Plate glass policies cover the risk of breakage, and can be extended to include resultant damage to goods in shop windows.

Personal accident policies, originally introduced to cover only railway accidents, were gradually extended to all accidents, then to accidents and specified diseases,

and finally to all accidents and all illnesses.

Public liability policies protect the insured in respect of claims brought, on the grounds of negligence, for personal injury or damage to property. This class of policy more particularly applies to the driving of horse-drawn vehicles and cycles, and to builders and contractors, shopkeepers and property owners; but there is a big demand nowadays for public liability insurance from all kinds of organizations and individuals.

An important feature in engineering insurance is the periodical examination which the companies make with a view to preventing breakdown and securing increased efficiency in the plant. The insurance companies issue the certificates required under the Boiler Explosion and Factory Acts. Weather insurance can also be effected.

Obligatory Insurance for Motorists

The Road Traffic Acts of 1930 and 1934 made it obligatory for every motorist to insure his liability to the public in connexion with road accidents; and in addition to this legal minimum protection, he can insure against damage to his own vehicle, fire

and theft risks, personal accidents, legal and medical expenses, and other inconveniences arising out of collisions on the road.

The most recent form of insurance is aviation insurance. The risks normally covered by a comprehensive policy are those of third party, legal liability to passengers, and personal accident to crew and officials; and, as regards damage to aircraft, the risks of crash damage, accidents on the ground, or mooring damage in the case of seaplanes, fire, and theft. The term "hulls covers" is applied to those sections of the insurance which concern damage to the aircraft itself. Cargo can also be insured under an aircraft policy.

Bibliography. Sea Insurance According to British Statute, W. Gow, 1914; Insurance, T. E. Young, 1927; History of Marine Insurance, H. G. Lay; Fire Insurance, T. R. Smith, 1927; Motor Insurance, Batten and Dinsdale, 1933; Accident Insurance, G. E. Banfield, 1935; Burglary Insurance, C. E. Golding, 1936; Arnould on the Law of Marine Insurance and Average, 12th Edition, 1939; Personal Accident, Disease, and Sickness Insurance, J. B. Welson, 1943; Marine Insurance, Templeman & Greenacre, 1946.

INSURANCE, NATIONAL: STATE CARE

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The development of national care for the sick, the disabled, the unemployed, and those bereft of their breadwinner is here traced from its inception in Germany in 1883 to the comprehensive Acts passed in Great Britain in 1946. See also Beveridge Report; Disabled Person; Health, Ministry of; Old Age Pension; War Damage; Workmen's Compensation, etc.

Social insurance may be defined as the insurance of all workers against the special contingencies to which their livelihood is exposed, and through which their activity stops temporarily or permanently. Such contingencies are: industrial injury caused by accident or disease in the course of employment, sickness, invalidity, old age, premature death, involuntary unemployment. Through all such possibilities workers and their families have a constant feeling of insecurity, which is an obstacle not only to their own well-being but also to the satisfactory organization of industry and social peace.

Measures to cope with the social effects of such contingencies go back to the fraternities and guilds of the early Middle Ages. With their disappearance in the 17th century, the worker was left to self-help in the form of co-operative insurance on a voluntary basis; this led to the formation of

friendly societies, the nucleus of social insurance. As industry developed, it became evident that voluntary social insurance of this kind was neither comprehensive enough, nor were the benefits granted sufficient, to protect the workers adequately against the ever-increasing risks to their social well-being. It became imperative that some form of compulsory insurance should safeguard workers against the economic effects of these risks, and that the state should play its part either by administering social insurance or by assisting financially schemes instituted and administered by the parties, i.e. employers and employees.

Compulsory social insurance, introduced in Germany in 1883, gradually conquered the world. "In every continent, and under every political, economic, or social system, whether liberal or authoritarian, collectivist or capitalist,

compulsory insurance is recognized as an essential factor of any rational social policy," states the I.L.O. World-wide acceptance of social insurance resulted in the development of fundamental principles and the adoption at international labour conferences of conventions aiming at greater unification of social insurance practice. By 1939, 19 countries had ratified the workmen's compensation (accidents) convention, and 16 the sickness insurance convention.

Workmen's Compensation Act

In Great Britain until 1946 social insurance was, as it remains in the majority of countries, divided into various branches—workmen's compensation, sickness insurance, pension insurance, unemployment insurance. Under the Workmen's Compensation Act, 1897, employers were made individually liable to pay compensation; insurance was optional except in coalmines, where special legislation passed in 1934 made it compulsory. All persons working under a contract of service or apprenticeship, except non-manual workers whose annual remuneration exceeded £350 and certain other groups of workers, were entitled to compensation for injury received in the course of their work. Benefits were given in case of incapacity and death; in case of partial incapacity, compensation was calculated as a percentage of earnings taking into account the difference between the worker's earnings before and after injury. The great majority of employers insured against their liabilities.

Compulsory health insurance was instituted by the Act of 1911, subsequently amended by Acts of 1926, 1928, and 1932. Insurance was compulsory for all employed persons aged 16 and upwards, with the exception of certain classes of non-manual workers and some other workers. The scheme was administered in the main through approved societies so far as sickness benefit was concerned, and by insurance committees as to medical benefits. Contributions were made by employers and the insured persons, and the state granted a subsidy. Insured persons were entitled to medical, sickness, disablement, maternity, and other benefits, on a flat rate.

Insurance did not enter into the old age pensions granted in 1909, but the Contributory Pensions Act, 1925, amended 1929 and 1932, related widows', orphans', and old age contributory pensions to compulsory insurance involving

contributions by employers and employees and a state subsidy.

Unemployment insurance, introduced by the National Insurance Act, 1911, extended by Acts, 1920-1933, and subsequent orders, made insurance against unemployment compulsory, with certain exceptions, for all persons between the ages of 16 and 65 who were employed under a contract of service or apprenticeship. Contributions were payable by employers, employees, and the state; benefits were on a flat rate.

This social insurance was supplemented by non-contributory old age and blind pensions, unemployment assistance, public assistance (replacing the old poor law), institutional treatment of disease, the lunacy and mental deficiency services, maternity and child welfare services, health services for school children, and special provisions as regards ship-owners' liability towards sick or injured seamen. In most countries such social assistance is the auxiliary of social insurance, and it has become an aim to integrate both into a single scheme. The main obstacle to such integration has been that, in most countries, social insurance has been related to certain classes of the population only, and is not national in character and coverage.

New Zealand's Lead

The first countries to introduce a system of comprehensive compulsory insurance for all members of the community—if we disregard the communist experiment in Russia—were New Zealand (1939) and Australia (1943). Their "income security schemes" were based partly upon a contribution from every resident to the cost of the scheme through a special income tax, thus differing from the schemes embodied in the National Insurance Acts, 1946, in Great Britain, based on the Beveridge report, 1942. That report aroused nation-wide enthusiasm. But before Beveridge's searching inquiry, royal commissions and parliamentary committees, private investigators, and courageous politicians like Sir Arnold Wilson (1884-1940) had raised their voices against the deficiencies of British social insurance: *e.g.* the low benefits, in particular under national health insurance; the exclusion of dependents from benefits granted to the breadwinner; the unequal benefits for equal contributions received through different approved societies; the overlapping

of insurance services and their high cost of administration; the evil of inadequate lump sum settlements under workmen's compensation, and the disturbing amount of litigation involved under industrial accident insurance; the exclusion of funeral benefit from statutory insurance (for burial insurance, the workers relied on industrial assurance, which has been severely criticised for its high expense ratio, its methods of canvassing, and the great number of lapsing policies); the inadequacy of medical treatment benefits under national insurance, which stood in sharp contrast to the general improvement in surgery and in methods of rehabilitation. Reform implied a radical change of method and a more comprehensive and more unified system of insurance, and the general application of the compulsory principle. This was the background against which the legislation that reached the statute book in 1946 was debated.

National Insurance Acts

That legislation consisted of two Acts, the National Insurance Act, 1946 (9 and 10 Geo. 6 Ch. 67), and the National Insurance (Industrial Injuries) Act, 1946 (9 and 10 Geo. 6 Ch. 62). The first provided unemployment, sickness, maternity, and widows' benefit; retirement pension, guardian's allowance, and death grant. The second provided insurance against personal injury caused by accident arising out of and in the course of a person's employment, and against prescribed diseases and injuries due to employment. [Medical treatment was covered by the National Health Service Act, 1946; rehabilitation, training, and resettlement of disabled persons by the Disabled Persons (Employment) Act, 1944.]

The benefits, paid at a flat rate, were considerably higher than under former schemes, and were supplemented by additional rights, *e.g.* increased benefit for children, increased benefits for adult dependents, unemployment and sickness benefit for persons over pensionable age. Expenditure on the scheme (benefits and administrative expenses) was estimated at £650,000,000 p.a. for the first years (of which £283,000,000 would be employers' and employees' contributions, £15,000,000 interest on existing funds); against £411,000,000 previously. The scheme covered the entire population of all ages, and of all occupations or none. Its aim was

expressed in the white paper on Social Insurance, part I: "In a matter so fundamental, it is right for all citizens to stand together, without exclusions based upon differences of status, function, or wealth."

To administer the scheme, the ministry of National Insurance was created by an Act of Nov., 1944, Sir William Jowitt being appointed first minister. The ministry began to function on April 1, 1945, taking over on that date the administration of existing social insurance schemes from the ministry of Health, the Welsh board of Health, the Scottish health dept., and the ministry of Labour and National Service, and from the Home office duties connected with workmen's compensation.

The 1946 Act retained the principle of tripartite contributions by employers, employees, and the Exchequer. Contributions, payable to the national insurance fund, varied in scale for employed persons, employers, self-employed persons, and non-employed persons; the Exchequer supplement also varied similarly.

Industrial Injury Scheme

The industrial injury insurance scheme set workmen's compensation on a new basis, making it a genuine social service. It included benefits at special flat rates (with family supplements) paid from a separate state insurance fund, to which employer, workman, and the Exchequer contribute. Lump sum settlements were abolished except in some cases of minor disability. For the earlier weeks, while the workman is incapacitated for work, there are injury allowances at uniform rates, followed if disablement is prolonged by industrial pensions based not—as was the system under the old workmen's compensation law—on loss of earning capacity, but upon the extent to which the workman has suffered disablement by the injury, by comparison with a normal healthy person of the same age and sex. This pension is not affected by any subsequent earnings of the workman, a point regarded by the drafters of the Act as a cardinal feature of the scheme, since it removed the previous grievance that an improvement in the workman's earning capacity resulted in an automatic reduction of his compensation, a fact which frequently prevented partially disabled persons from resuming work as early as possible, and from undergoing

all possible rehabilitation treatment. The basic disablement pension under the Act was 45s. a week where the degree of disablement was assessed at 100 p.c., falling to 9s. where disablement was not more than 20 p.c. The industrial pension was supplemented by a special allowance if the pensioner was unemployable; and was subject to additions to cover family responsibilities, and, in special cases, treatment and attendance. *Consult* Approaches to Social Security, I.L.O., 1942; National Health Insurance, Hermann Levy, 1944; National Health Insurance in Great Britain, 1911-1946, R. W. Harris, 1946.

Insured Person. One compulsorily insured and entitled to benefits under certain British Acts of parliament. Such were the National Health Insurance Acts, Unemployment Insurance Acts, and Widows', Orphans', and Old Age Pensions Acts, merged 1948 into one system under the National Insurance Act, 1946. The National Insurance (Industrial Injuries) Act, 1946, replacing the Workmen's Compensation Acts, introduced additional cover for certain categories of insured persons.

Intaglio (Ital.). A process of printing from hollows which have been engraved or etched out of a smooth surface, such as a metal plate. It is more familiarly known as photogravure (*q.v.*).

Integration (Lat. *integer*, whole). The inverse process to differentiating. An integral may be regarded as the summation of a series of consecutive values of a continuously varying quantity. The problem of finding the area of a space bounded by known curves may be considered as a problem in integration, since it can be solved by considering the summation of a number of small areas. *See* Calculus; Function.

Intellect (Lat. *inter*, between; *legere*, to choose). Term denoting the cognitive faculties of the mind, the capacity of knowing. These faculties include perception, memory, and judgement, but exclude sensation. According to the Scottish school, intellect was equivalent to common sense (*q.v.*). Earlier philosophers, *e.g.* Locke, used the word understanding in preference to intellect. Intellection signifies a process, the exercise or activity of the intellect. *See* Metaphysics.

Intellectualism. In philosophy, the theory that the true nature of things can be learned only by the light of pure reason, not by sensual perception or intuition. In ethics,

intellectualism is the theory that the fundamental laws of morality have their source in reason; thus Socrates regarded virtue as something that could be taught. The word also means an excessive devotion to intellectual pursuits. *See* Philosophy.

Intelligence (Lat. *intelligere*, to understand). Term used for the power of comprehending, digesting, and evaluating experience. It is closely linked with memory, attention, and curiosity, and has been defined as "the ability of an organism to solve new problems, to meet novel situations by improving adaptive responses." The seat of the intelligence is the hemispheres of the brain, which differ in man from those of the higher animals by the greater quantity of white connective nervous tissue and not by any special organs. The outstanding development of the intelligence in human beings is connected with their possession of hands, which offer a vastly increased range of sense data for the appraisal of the mind, and increase the number of possible reactions.

Intelligence is inherited, and though it can be made far more useful by good training and the formation of varied interests in early life, it cannot be increased in amount. On the other hand, it may be seriously impaired, for instance by teaching children beliefs which conflict with apparent facts, or are inconsistent one with another. The destruction of mental integrity thus produced has been found to remove one of the main safeguards against crime and evil-doing, since it enables the sinner to disregard facts and believe the fantastic excuses which he invents to justify his actions. *Consult* The Nature of Intelligence, C. Spearman, 1924; The Mentality of Apes, W. K.öhler, 1925; Factors of the Mind, C. Burt, 1940; Factorial Analysis of Human Ability, G. Thomson, new ed., 1946.

Intelligence, MILITARY. Collation and interpretation of information collected by army, navy, and air force intelligence officers regarding an actual or potential enemy and the appreciation of its military value; also the denying of similar information to an actual or potential enemy. In Great Britain intelligence departments are attached to the three fighting services of the crown; the intelligence division at the Admiralty deals with naval intelligence; there is a director of intelligence at the Air ministry;

and the Intelligence Corps is responsible for supplying information to the War office. The Intelligence Corps was formed during the First Great War, but its members were then regarded as staff officers and did not wear any distinctive badge. In July, 1940, the corps became a separate unit with its own cap badge, a crown surmounting a rose, emblem of security, resting on a laurel wreath, representing military achievement, and a green shoulder flash.



Intelligence Corps badge

Espionage and military intelligence are very closely linked; the first involving the collecting of information, the second its interpretation. For example, during the Second Great War an officer of the Intelligence Corps, Col. Scotland, served in the German army in order to secure information about the enemy's morale and dispositions.

Intelligence Services in Peace Time

In peace time the intelligence branches collect information regarding the counterparts of their services in foreign countries, and devise means whereby, in the event of war, all essential details concerning the enemy's strength in men and equipment and his probable strategy and tactics can be placed at the disposal of commanders in the field, on the sea, and in the air. Information which can readily be collected in peace time includes such details of other countries' military potential and organization; strength and power of expansion, defence works and fortresses; road, rail, water, and air communications; telegraph, cable, and radio systems; economic and industrial resources in relation to military requirements; and the characteristics of military leaders, together with forecasts of their probable tactics and strategy in the event of war.

During a campaign, intelligence services are expanded, and while every effort is made to keep information up to date, equally energetic measures are initiated to baulk the enemy's intelligence service. Intelligence units specially trained to note and interpret any details which may reveal new enemy weapons, tactics, or formations accompany the fighting services on operations. Aerial photographic reconnaissance is of

great importance, the interpretation of aerial photographs requiring special skill and training. Air crews returning from an operation report their observations; so do submarine and other naval commanders and military scouting parties. Prisoners are skilfully interrogated; captured documents are examined; radio signals are intercepted and interpreted; the neutral and enemy press is studied.

In the Second Great War, military intelligence on both sides sometimes failed of its purpose. For instance, the British were in many respects badly informed as to Germany's actual military strength and plans of strategy, while their interpretation of much of the accurate information in their possession was ignored by the govt., with disastrous results in France and Norway, while German intelligence failed to realize the full implications of radar (the radar watch maintained round Britain materially assisted the numerically inferior R.A.F. to defeat the Luftwaffe in the Battle of Britain), or the strength and recuperative capacity of the Soviet armies, and failed also to anticipate the time and place of the Allies' two major invasions, those in N. Africa and Normandy.

Notable achievements of British military intelligence during the Second Great War were the securing of details of the flying bomb nearly two years before the first one was launched against England; the interpretation of details of the German Tiger tank, resulting in the production of the 17-pounder gun to meet it; and early knowledge of the radio-controlled torpedo boat.

Intelligence Test. Method of measuring intelligence. The problem of defining "intelligence" continues to cause difficulty in any explanation of the use of intelligence tests, partly because "intelligence" has several meanings in ordinary speech, and also because psychologists themselves, although they must be more specific, find they cannot adhere to one rigorously exclusive concept; but the meaning which psychologists are most inclined to use is that of native wit, the capacity to think and to solve problems. The purpose of the intelligence test is to measure this capacity in a way which does not confuse it with education, previous experience, and special aptitude. It is directly concerned with the innate ability to learn. The

possibility of assessing this capacity was suggested by Galton in his "Enquiries into Human Faculty and its Development," 1883, but the first practical step to meet a need was taken at the beginning of the 20th century in Paris, when the educational authorities began to consider setting up special schools for those who could not respond to the ordinary curriculum. The problem was to sort out those who did not have the capacity to learn from those who were described as "merely lazy." By setting tasks successively to groups of children of different ages, Alfred Binet and Theodore Simon learned what was the normal achievement of the 6-year-old, the 7-year-old, and so on, and evolved the Binet-Simon tests of intelligence, performance in which provided the basis for measuring the individual child. A child who could attain the norm of the 8-year-old had a mental age of 8 years, but a child of 12 who could attain only the norm of a child of six had a *mental age* of six years. Later investigators adopted the method of expressing the ratio of the mental age to the chronological age as the child's intelligence quotient, or I.Q. Thus, a child aged 6 years who attained the norm of the 8-year-old had an I.Q. of $\frac{8}{6}$ or 133 p.c.; a child aged 10 years who could attain only the norm of the child of 8 years had an I.Q. of $\frac{8}{10}$ or 80 p.c.

Many investigators have continued the work of Binet and Simon, and investigations still go on. Well known intelligence tests are Stanford revision (of the Binet), Otis, Cattell, Ballard, Terman-Merrill, and the Alexander performance scale.

Intelligence tests are used (1) to assess the capacity of a child to benefit from a particular curriculum and so to choose the type of secondary school (grammar, technical, or modern) most suited to him or her; (2) to indicate special aptitudes, i.e. types of proficiency attainable with not more than the average difficulty, and thus to discover the most promising avenues for specialisation either in study or in employment.

There are now many kinds of intelligence tests. Their aim is to measure only some aspects of intelligence, e.g. power to understand words and symbols; response to instructions, suggestions, warnings, etc.; capacity to perceive differences, similarities, contrasts, or the complementary nature of ideas, shapes, colours, etc.

Intelligence tests have been prepared for people who cannot read, and have been applied to the assessment of character, temperament, sense of right and wrong, social sense, and physical reactions.

In the Binet-Simon tests and their derivatives the problems were all put in verbal terms. A typical word intelligence test set to children of 11 years is:

In each of the sets of words below one word means something rather different from the other three. Find that one word and underline it—*example*: herring, cod, *pork*, salmon:

- (a) piano, violin, drum, banjo;
- (b) herd, flock, pack, crowd;
- (c) road, tram, train, car;
- (d) here, there, when, where;
- (e) strong, vigorous, health, energetic—(up to 32 sets).

Disadvantage of Verbal Tests

Verbal tests have, however, a disadvantage, namely, that no matter how simply the questions are put, some element of dependence on education cannot be eliminated. Psychologists and educationists therefore developed also non-verbal tests in which literacy played no part. Such tests are the Goddard form-board (a board out of which pieces of various shapes—stars, squares, etc.—have been cut; the test is to fill the empty spaces with the correct pieces), the Healy picture-completion test, Koh's blocks, the Penrose-Raven matrices.

First experiments in the use of intelligence tests were concerned with children, but it became apparent that such tests could also be usefully applied to adults. The first mass application of intelligence tests to adults was in 1917-18, when nearly two million recruits to the American army were tested. Highly developed intelligence tests were used by the British, German, and American armies in the Second Great War. The British army used them as part of a comprehensive scheme, in which many other kinds of psychological tests were used, for the selection of men for army duties and for commissions. They were also used as an aid to psychiatric diagnosis. Their significance in this connexion is that intellectual capacity may play an important contributory part in certain kinds of neurosis. Intelligence tests are also extensively used for vocational guidance in civil life, particularly in the U.S.A.

Intelligentsia. Term for that section of a population to which culture, intelligence, and advanced

political views are attributed. The word came into use in Russia in the 1860s through P. Boborikin, and occurs in English in a translation of L. Tikhomirov's *Russia, Political and Social*, by Edward Aveling, 1888. Maurice Baring used it several times in his *The Russian People*, 1911; and H. W. Williams devoted a chapter of his *Russia of the Russians*, 1914, to the intelligentsia.

Intendant (Lat. *intendere*, to apply the mind to, take care of). Name given in France before the Revolution to certain high officials. They first appeared in the 14th century, being then concerned with collecting the royal revenue, and later they were in charge of the department of finance. Intendants of the various positions were first appointed by the king about 1580, and although at first temporary, they became permanent. Gradually they obtained additional powers until in the 18th century they were superior even to the governors.

Intensifier. Device used as an alternative to, or in conjunction with, an hydraulic accumulator for increasing the initial pressure of a constant hydraulic supply. By means of the intensifier, pressures up to five tons per sq. in. can be obtained from any initial pressure. In photography, an intensifier is a reagent whose application under given conditions increases the density of a negative, and consequently its printing value, or the depth of an image on bromide or other sensitised paper. See Accumulator; Hydraulics.

Intensive Cultivation. Methods of forcing vegetables and salads. Formerly, this was done by planting in rich soil containing large quantities of manure, under cover of bell-glasses and frames—a method which lapsed because of the increasing difficulty of obtaining manure. The plan now adopted is to use cloches which protect the crops in winter and hasten their growth, and to keep the soil fertile with moderate quantities of manure and fertilisers. Another practice is cultivating early crops in garden frames placed on hotbeds of fresh manure or a mixture of that and dry leaves. These methods are of value chiefly from late autumn to spring for production of vegetables and salads out of season. In market gardens cloches have superseded the old bell-glasses.

From seeds sown in Aug.—Sept. and again in Jan., on soil placed on hotbeds in frames, small carrots, radishes, and lettuces are raised.

The roots of asparagus, sea kale, rhubarb, and chicory can be forced likewise. The usual method of heating soil in garden frames is by electric cables. Germination of seeds sown out of doors in spring, e.g. spinach, beans, peas, and lettuce, is hastened by cloches. Gardeners use borders near south-facing walls for the earliest vegetables, and by covering these with frames and cloches bring them to maturity much more quickly than others in the open garden; this practice, allowing of more crops than usual being grown on a given site, intensifies the yield from the garden. Intercropping means that vegetables which mature quickly, e.g. lettuce, spinach, radish, are sown between rows of others that are slow.

Intention. In English law it is a maxim that the intention is to be regarded rather than the form. But in construing legal documents the court must always deduce the intention from the words of the document. If the language is clear, no one will be allowed to say that something else was intended. If there is an obscurity, in certain cases evidence may be adduced to show the meaning. Thus, where a testator bequeaths a legacy "to my niece Margaret," and he has two nieces of that name, it would be proper to allow evidence to show that he always spoke of one as Margaret and the other as Maggie.

Interbourse. Term meaning international in the financial sense. Interbourse securities can be bought or sold with equal ease on the stock exchanges of London, Paris, New York, and elsewhere. See Stock Exchange.

Intercalary (Lat. *intercalare*, to insert). Term for days (or months) officially inserted in the calendar at any period, chiefly in order to bring the lunar year into correspondence with the solar year. (See Calendar.) The term intercalary is also used biologically for something intermediate between two types; botanically for a special form of growth in fungi and algae; geologically for a layer of different kind occurring between the regular strata.

Interdict (Lat. *interdicere*, to forbid). Term used for an ecclesiastical punishment imposed by a pope, bishop, or other prelate. A general interdict is when all public worship, burial services, and the administration of the sacraments are forbidden; "such was that laid upon England in 1208 by Pope Innocent III. A local interdict is

when a diocese or parish is similarly punished. The corresponding punishment for an individual more usually takes the form of excommunication. Even from general interdicts some exceptions were recognized, and none was ever completely enforced. (See Excommunication.)

In Scots law an interdict is a judicial order forbidding certain proceedings. It corresponds to the English injunction (*q.v.*).

Interest (Lat., it is between). In finance, money paid for the loan of money; payment for the use of capital; share of the product accruing to the owner of the capital used. More generally, it is a share in a property or undertaking, *e.g.* a quarter interest in a ship. One has an insurable interest in a person or thing if one would lose by the occurrence of the event insured against, *e.g.* the death of the person or the damage of the thing. An interest charge is normally expressed as a percentage per annum; interest at 5 p.c. per annum means a charge of £5 for the use of £100 (or £100 worth) for one year. Hence the interest on £350 at 5 p.c. per annum for three months would be $£3\frac{1}{2} \times \frac{3}{4}$ (since three months is $\frac{3}{4}$ year). Simple interest on £*p* (the principal) at *r* p.c. for *t* years is $\frac{£prt}{100}$.

The difference between simple and compound interest (usually reckoned for periods greater than one year) is that when money is lent at compound interest, the sum accruing for one period (year, half-year, or quarter) is added to the principal in order to calculate the interest during the next period. Thus at 5 p.c. per annum, the first year's interest on £100 would be £5, but the second year's interest would be 5 p.c. of £105. Annuities, leases, and endowment assurance policies, etc., involve compound interest. Bank rate is the rate per cent per annum of interest at which the Bank of England will make loans on first-class security to people other than its regular customers.

The rate of interest on money can be assumed to include the price paid (*a*) for the use during an agreed term of another's money or purchasing power; (*b*) for the risk that the money will not be repaid; (*c*) sometimes for the risk that the money when repaid will have less purchasing power than it had when the loan was made, prices having risen; (*d*) sometimes for the lender's forgoing

opportunities of using the money profitably. Because (*b*), (*c*), and (*d*) vary considerably in individual transactions, rates of interest charged may range from, say, $\frac{1}{2}$ p.c. per annum offered by banks on time deposits to 1d. in 1s. per week, *i.e.* 433 $\frac{1}{3}$ p.c. per annum, charged by some moneylenders. (Under the Moneylenders' Act, 1927, a rate of 48 p.c. per annum may be charged.)

Interest on money invested in the equipment and materials employed in the production of a commodity is included by the accountant as a cost of manufacture or of sale; hence interest affects the price at which a commodity tends to be offered for sale.

HISTORICAL. Among the Romans interest was primarily special compensation paid by a borrower who was unable or unwilling to repay the principal. *Usura* denoted interest paid for the use of money borrowed. From this comes the word usury, now applied only to excessive or harsh interest rates.

Morality of Interest and Usury

The morality and the economic significance of interest and usury have been discussed through the ages. Numerous passages in the O.T. forbade it among the Israelites; Plato, Aristotle, Virgil, and Plutarch condemned it; in the 8th century it was forbidden in England; the prohibition was repeated in the 12th, 13th, even the 14th century. The Christian Church taught that money was barren and interest was therefore extortion; those lending to the unfortunate should do so as an act of charity. Later a distinction was made between lending money or goods for profit-making and lending for personal use: the former entitled to interest, the latter did not.

Most loans in early and medieval times, however, were to the nobility for personal expenditure and to the crown for waging war. Such lending was permitted only to the Jews, who were protected by the king but whose reserves he sometimes raided. In 1545 Henry VIII legalised interest up to 10 p.c. This maximum was reduced to 8 p.c. in 1623, to 6 p.c. in 1651 and again in 1660, and to 5 p.c. in 1713. Not until 1854 were all restrictions removed. The Moneylenders' Act, 1900, empowered the courts to adjust contracts involving excessive interest charges. It is generally thought that the legal maxima established at different times were often exceeded.

The changed attitude towards interest reflects the development of economic organization. Whilst loans were made almost wholly to the unfortunate or the profligate, usury was condemned. As opportunities grew for productive employment of resources, a distinction developed between interest and usury. The former became respectable and customary as the lender's share of the profit of the enterprise made possible by the loan. With the growing complexity of industry, commerce, and politics, the distinction between productive and unproductive loans became blurred. Invention and discovery made necessary huge aggregations of purchasing power to provide buildings and equipment, and eventually lending and investing were distinguishable only by the terms of the contract. The principal difference is that the lender (*e.g.* debenture-holder) is entitled to interest and repayment of his loan irrespective of the success of the enterprise, while the ordinary investor or shareholder is entitled only to interest (included in his dividend), variable with the success of the enterprise, and not to repayment of principal until the company is wound up.

Interest has been variously explained by economists. It has been regarded as (*a*) the value of the money in use; (*b*) the reward of abstinence, *i.e.* refraining from spending; (*c*) the expression of the individual's greater valuation of the present than of the future; (*d*) the price of the productive service of the capital that the money supplied will buy; (*e*) the wages of the labour which produced the purchasing power lent; (*f*) (by Marx) the result of taking part of the labour of others; (*g*) (by Keynes) the measure of the unwillingness of those who possess money to part with their liquid control over it: "the reward of not hoarding."

Keynes and Control of Interest

Keynes distinguished between the interest of money and the interest of other commodities, considering that money has inherent qualities which tend to keep the rate of interest on it unduly high compared with that of other commodities. In consequence, "a wise government is concerned to curb it" (the rate). He thought controls necessary to bring about an adjustment between the propensity to consume, the inducement to invest, and the tendency to hoard. He prophesied the gradual extinction of the class

living on unearned income received from investment. Keynes's teaching had a great effect on British financial policy from 1925. See Banking; Capital; Compound Interest; Moneylender; consult Principles of Economics, A. Marshall, 1895; General Theory of Employment, Interest, and Money, J. M. Keynes, 1936.

H. Watson, B.Sc.

Interest Table. Columnar arrangement showing the effect on £1 (or £1 per annum) of the addition of simple or compound interest for various periods at different rates. Simple interest is generally reckoned for periods of less than one year, and a table normally states the interest on £1 at various rates p.c. for a number of days. Interest tables are particularly useful in calculations involving compound interest for a number of years, in connexion with annuities, the valuation of leases, securities, etc.

Compound interest tables may show: (a) the sum to which £1 will amount at the end of various years at various rates; (b) the present value of £1 receivable at a stated number of years hence; (c) the amount derived from putting in £1 per annum for a stated number of years; (d) the present value of £1 per annum for a stated number of years; (e) the annuity which can be bought for £1 paid now. Such tables are of great value to actuaries.

Interfacial Tension. Molecular tension existing at the interfaces (or adjacent surfaces) of any two immiscible liquids. Oil and water do not mix, but it is often desirable to bring about an emulsion of the two. One practical application is the use of soaps or detergents, which enables dirt and grease to be washed away from clothing, etc. The soap molecule, or that of the modern detergents which chemists have synthesised, is peculiar in that it may be compared to a short rod, at one end of which is a fat-soluble portion and at the opposite end a water-soluble portion. If soap or detergent is introduced into a watery fluid in which is a greasy film, some molecules of the introduced substance align themselves across the interface between the grease film and the aqueous solution, and tend to attract the oil molecules down into the water, in effect bringing about an emulsion. See Brownian Movements; Colloid; Detergent.

Interference (Lat. *inter*, between; *ferire*, to strike). In

physics, the action at a point when two or more wave motions combine, the effect produced being dependent on their wavelengths, amplitudes, and phases. It is assumed that each wave system exerts the same effect as if the other motions were absent, so that the actual displacement of any particle in the path of the waves is the sum of the displacements it would sustain from each set of waves acting separately.

Imagine that two similar waves are travelling over water and that at a particular place and instant their crests coincide. According to the principle of superposition, the height of the combined wave will be doubled; this is termed constructive interference. But if the crest of one wave coincides with the trough of the other, the surface at that point will remain undisturbed, and destructive interference is said to occur.

The phenomenon of the interference of sound waves may be illustrated by means of a vibrating tuning fork held in the hand at ear-level and gradually rotated. Marked regions of constructive and destructive interference will be noted, due to the mutual action of the sets of waves sent out by each prong.

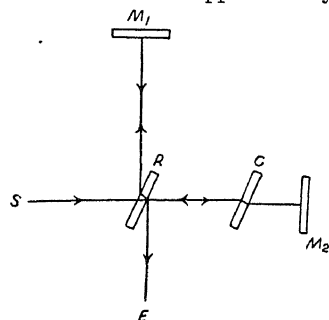
The alternate dark and bright bands observed in optical interference experiments are known as interference fringes. The brilliant colour effects of thin films of oil on a wet road are due to interference between light directly reflected from the upper surface, and the part of the incident wave which was transmitted at the upper surface and has suffered one or more internal reflections at the lower interface before emerging into the air at the upper surface.

In radio, interference means the reception of unwanted signals by a receiver. When the receiver is tuned to a particular transmitting station it is not completely isolated from the influence of other stations. If the receiver is near a local transmitter, interference may be brought about by currents induced in surrounding wires. Atmospheric disturbance and man-made "static" occur almost universally, and the only effective counter is to ensure that the received signal is as strong as possible compared with the unwanted noise.

Interferometer. An optical instrument for measuring small distances in terms of a known wavelength of light or of the wavelength of light in terms of a

standard of length. It can determine the refractive indices of gases, and its high sensitivity for this type of measurement allows detection of small quantities of poisonous gases in the atmosphere.

One form of interferometer, the Michelson, is illustrated in the diagram, the essential features being two plane mirrors M_1 and M_2 and two identical and parallel glass plates R and C . R is lightly coated with silver on its back surface so that approximately



half the incident light is reflected to M_1 and the other half is transmitted to M_2 . The compensator plate C is included so that the two optical paths followed by the original beam after incidence on R contain the same thickness of glass. If the distances from R to M_1 and M_2 are exactly equal and if M_1 and M_2 are perpendicular to one another and at 45° to R , then the two beams will arrive in phase at E and constructive interference will take place.

Where adjustment is not exact, a system of interference fringes will be observed. A displacement of M_2 , say through one half wavelength, causes each fringe to move into the position occupied by an adjacent fringe. If n successive dark (or light) fringes are counted as M_2 is moved through a distance d , then

$$d = n\lambda/2 \text{ or } \lambda = 2d/n$$

where λ is the wavelength of the light. S indicates the source of light and optical system to produce the incident parallel beam.

Interglossa. Plan for an international language devised by Lancelot Hogben. Its word material is based on roots, mainly Greek, internationally current in science, and its grammar is reduced to a minimum. The vocabulary contains some 10,000 words. Consult Interglossa, L. Hogben, 1943; English-Interglossa Dictionary, D. Baker, 1943.

Interim (Lat., meanwhile). A word for temporary decrees of a ruler. It was chiefly used during

the time of the Reformation to embody a temporary settlement of religious matters. A notable example is the Augsburg interim of 1548. *See* Reformation.

Interior, MINISTRY OF THE. Department of government in various countries; it corresponds roughly to the home office of the U.K. The interior department of the U.S.A. is headed by a secretary who is a member of the cabinet. It was established in 1849.

Interjection (Lat. *inter*, between; *jacere*, to throw). Sound or word expressing emotion or passion. The interjection belongs to the earliest stage of language, and is the result of involuntary movement of the organs of speech. Grammatically it stands apart from a sentence. Examples are Oh! and Pooh! *See* Language.

Interlaken. Town and summer resort and tourist centre of the Bernese Oberland, Switzerland. On the Aar, between lakes

engrossed or fairly written out for execution, or after it has been executed. Unless interlineations are initialled or otherwise noted as having been made before the deed was executed, they render a deed void.

Interlocutor (Lat. *inter*, between; *loqui*, to speak). Word meaning literally one who takes part in a dialogue or conversation. In Scots law, an interlocutor is strictly an interim judgement before the final decision, but in practice is extended to include any order. In English law, interlocutory proceedings are proceedings before the trial of the action.

The name interlocutor, or Mr. Interlocutor, was given to the compère of the once-popular negro minstrel entertainment. In the "sit round" his place was in the centre, the two extremities of the semi-circle being occupied by "Mr. Bones" and "Mr. Tambo," who addressed their interjections

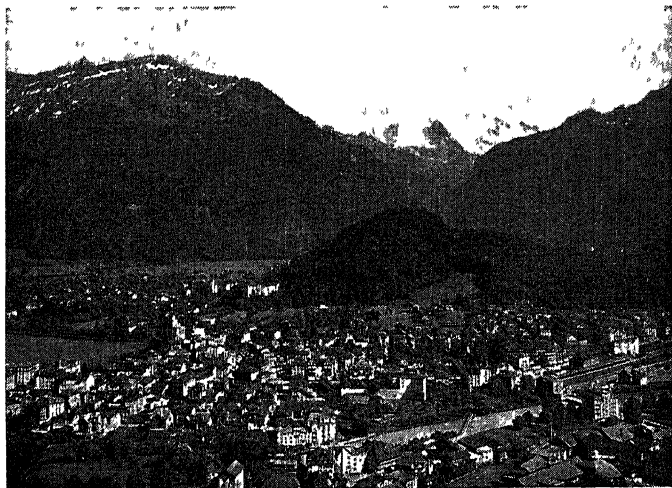
e.g. the rustic performance in Shakespeare's *Midsummer Night's Dream*. *See* Drama; Mystery.

Intermarriage. Marriage between persons belonging to the same family or tribe. The word is particularly applied to the union of persons related to each other by ties of consanguinity and affinity which have been regarded as bars to marriage under various systems of law. The old canon law forbade as incestuous marriage between persons related within the seventh degree of consanguinity and affinity and declared the offspring bastard. English law allowed the canon law to denounce marriages as incestuous and impose ecclesiastical penalties, but refused to acknowledge its power to bastardise the issue, and in 1547 an Act authorised all marriages allowed by the Levitical law. Similar restrictions obtain in Scots and French law.

The table of kindred and affinity in the Prayer Book sets forth the degrees of relationship within which marriage is prohibited by the Church of England. It was put forth by Archbishop Parker in 1563 and adopted by the 99th canon of 1604, and remains the authoritative list of the Church of England and also of English law, save that by Acts of 1907, 1921, and 1931 a man may marry his deceased wife's sister, his deceased brother's widow, his deceased wife's aunt or niece, his deceased uncle's or nephew's widow. A clergyman is liable to ecclesiastical censure if he conducts a marriage within prohibited degrees.

Intermediate State. Condition of being of the soul between death and its final destination. The parable of the Rich Man and Lazarus and other passages teach that the souls of the righteous pass into a state of peace and happiness, while those of the wicked are in a state of misery. But the use of the terms Hades and Paradise for this state implies that it is something different from heaven and hell; and all information about the Second Advent of Christ, the resurrection of the dead, and the final judgement goes to show that the present state of the departed is not final. *See* Immortality; Purgatory.

Intermezzo (Ital.). In music, an interlude or entr'acte. The term is frequently applied either (a) to an instrumental piece designed to fill up the time while necessary changes are being effected on the stage, or (b) to an independent composition of small



Interlaken, Switzerland. The hill on the left is the Schnige Platte. The snow-covered peaks in the background are the Monch (left) and Jungfrau (right). The gorge in the centre leads, right, to Lauterbrunnen, and, left, to Grindelwald

Thun and Brienz, at an alt. of 1,860 ft., it is 17 m. by rly. S.E. of Thun, with which it has also steamer connexion. It commands magnificent views of the Jungfrau and neighbouring mountains. Interlaken grew up round a monastery founded in 1130 and suppressed in 1528. Parts of its old church are now used for French Protestant, R.C., Anglican, and Presbyterian services. The castle, added in 1750, is now occupied by cantonal offices. There is also a kursaal. Pop. 9,000.

Interlineation (Lat. *inter*, between; *linea*, a line). In English law, any written matter inserted in a document after it has been

to him as to a chairman. *See* Christy Minstrels.

Interlude (Lat. *inter*, between; *ludus*, play). Name given to early plays from the time of the morality plays onward to the full development of the drama in the Elizabethan age, especially to plays performed by professional actors. The moralities are themselves frequently referred to as interludes, as in The Goodly Interlude of Nature, The Interlude of Youth, and others. The name is supposed to have arisen from the plays being occasionally performed in the intervals of banquets and entertainments. It was also used to designate a play within a play,

dimensions. Originally, however, it designated a dramatic piece of light character played between the acts of a more serious drama or opera, partly for the sake of relief, partly to rest the performers. Such an intermezzo had no connexion with the play. The ballet in an opera is really an intermezzo introduced more or less arbitrarily. The intermezzo, which is centuries old, eventually developed into the opera buffa. See Ballet; Opera.

Intermittent Claudication. A condition in which severe pain comes on in one or both legs while walking. Occurring in elderly men and aged horses, it is due to degenerative changes in the arteries, resulting in a poor supply of blood to the muscles. Cramp then arises from lack of oxygen supply to the local tissues. The outlook for recovery is poor. This condition was probably Sir Walter Scott's complaint.

other hand, later internal combustion engines of the compression-ignition type convert 30 to 35 p.c. of the heat supplied to useful work, and this percentage can be increased appreciably by use of some of the heat in the exhaust gases for generating steam or driving exhaust turbines.

Internal combustion reciprocating engines can be roughly divided into two main classes: (1) those in which the fuel (gas or petrol) is mixed with air before admission to the cylinder; (2) those in which air only is admitted during the induction stroke, the fuel (heavy oil) being injected in the form of a fine spray at or near the end of the compression stroke. In the first class the fuel must be either gas or a liquid which is easily vaporised at ordinary temperatures, and compression pressures must not be so high that pre-ignition occurs. Ignition is by spark, and in the case of a petrol engine a carburetting device is required. The carburetter is required to vary the supply of petrol with the flow of air so that an approximately constant mixture strength is maintained. In engines for motor vehicles the speed of revolution of the engine and degree of throttle opening may vary within wide limits and the complications of later carburetters are designed to cope with such variations in addition to providing rapid acceleration when required. In the case of aero engines the engine speed does not vary greatly, but the density

INTERNAL COMBUSTION ENGINE

A. T. J. Kersey, M.I.Mech.E., Consulting Engineer

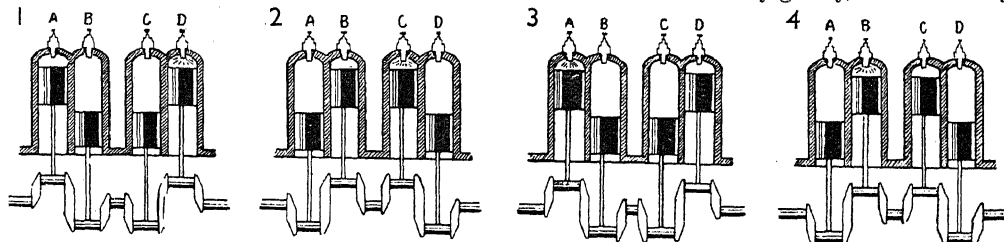
The principle upon which the internal combustion engine works is here explained, and some indication given of its diverse purposes. See also Aero-Engine; Aeroplane; Diesel Engine; Gas Turbine; Motor Vehicle; Oil Engine

The advent and rapid development of the internal combustion engine as a reliable source of power, both in small and large sizes, has had an enormous influence on the extension of transport by land, sea, and air. Its convenience for quick starting up from cold, transport and easy storage of fuel, and absence of stand-by losses, together with the economical fuel consumption of the compression-ignition type at loads varying from half to full power, has led to the displacement of the steam engine from many fields. It is now in general use for farm tractors and other agricultural appliances, cement mixers, portable air compressors for pneumatic drills, excavators, cranes, etc., and has exercised a profound influence on warfare.

In an internal combustion engine the combustion of the fuel and

consequent generation of heat takes place inside the engine cylinder, so that no part of this heat is wasted before it reaches the engine. Very high temperatures, however, are generated in the combustion space and losses of heat occur to the water jacket or cooling fins and in the high temperature exhaust gases, so that, but for the fact that the cycle of operations is inherently more efficient than that of the steam engine or steam turbine, these losses might outweigh the advantages of internal combustion.

In actual practice the reciprocating steam engine converts from 5 p.c. to 20 p.c. of the heat of the fuel to useful work. The higher efficiencies can be maintained only by careful attention to the boiler and condenser and fall appreciably with reduction of load. On the

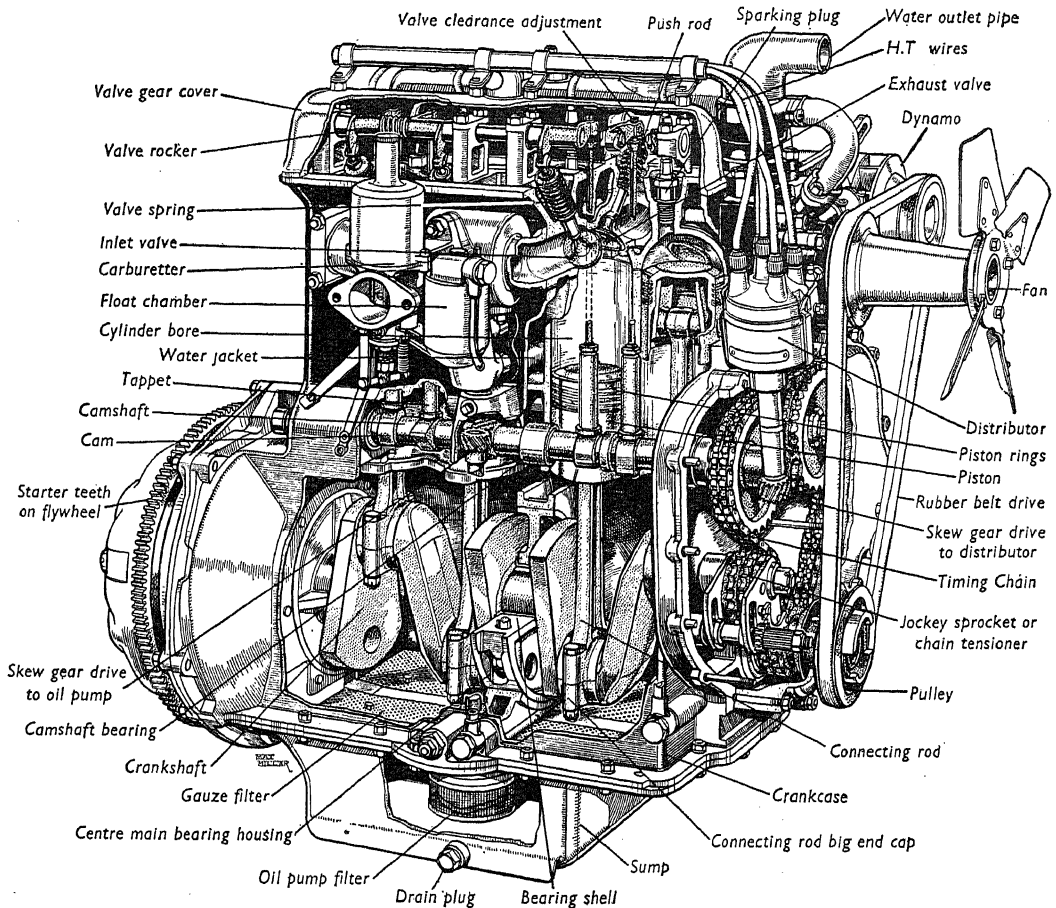


The diagrams show in a simplified form the following sequence of operations in a four-stroke engine: suction during the first downstroke of the piston; compression of the mixture of petrol vapour during the following upstroke; ignition of the compressed mixture at the dead-point, or top of the cylinder, and subsequent expansion of the exploded gases inducing the next downstroke; and expulsion of the burnt gases during the next upstroke.

In Fig. 1, the pistons have been set in motion by an initial turn of the crankshaft, either by hand or by self-starter. Piston A has started to move downwards in its cylinder, and as it does so a port, or valve, opens, enabling it to draw into the cylinder by suction a small quantity of air and petrol which has been vaporized by the carburetter. This is called the intake stroke. In Fig. 2 piston A has reached the bottom of its intake stroke and the gas inlet valve is closed. Piston A then starts to move upward, compressing the explosive mixture into a very small space, as in Fig. 3, when an electric spark, induced by the magneto, jumps across the contacts of the spark gap and ignites the

compressed and explosive mixture to create a rapid and violent expansion of the gas. The explosion drives the piston downwards, and gives a turn to the crankshaft. As piston A in Fig. 4 completes its downstroke and begins to move up again, an exhaust valve in the cylinder opens, and the face of the piston pushes the burnt gases into the exhaust, whence they are dissipated into the air. These operations are repeated by each of the four pistons in turn thus: in Fig. 1 suction starts in piston A, exhaust in piston B, compression in piston C, ignition and working stroke in piston D; in Fig. 2 compression starts in piston A, suction in piston B, ignition and working stroke in piston C, exhaust stroke in piston D; in Fig. 3 ignition and working stroke starts in piston A, compression in piston B, exhaust in piston C, suction in piston D; in Fig. 4 exhaust starts in piston A, ignition and working stroke in piston B, suction in piston C, compression in piston D. The downstroke of one piston always initiates the upward stroke of another, the revolution of the crankshaft being converted into linear movement.

INTERNAL COMBUSTION ENGINE: DIAGRAM SHOWING IN PRINCIPLE HOW IT WORKS



The diagram shows a Riley 4-cylinder engine, viewed from the right-hand side and illustrating the compactness of the car's power unit. Notable features include the overhead valves operated by push-rods and rockers, and the skew gear drive

to the oil pump. Lubrication is by a large-capacity oil pump which draws filtered oil from the sump and delivers it at high pressure to the main bearing and camshaft bearings, the rocker gear, and the big ends. The engine is rated at 12 h.p.

INTERNAL COMBUSTION ENGINE: CUTAWAY DIAGRAM SHOWING ITS PARTS

Courtesy of "Autocar"

of the air supply will vary with altitude. Economical fuel consumption is also of much greater importance, so that, even when boosting is used, the carburetter has to satisfy different requirements and in fact is of quite different design. In Germany and later in the U.K. considerable success has been obtained with the injection of the volatile fuel directly during the induction stroke, thus substituting a fuel pump for the carburetter. Accurate metering of the volatile fuel and adequate vaporisation during the induction and compression strokes are main problems in this case.

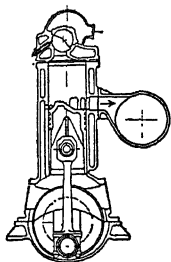
In the second class the air is compressed to a sufficiently high pressure and consequent temperature for self-ignition to take place when the fuel is injected into the combustion space, so that no

special ignition device is required. Sufficient turbulence, or swirl, to ensure mixing of the air with the atomised fuel is necessary to ensure rapid and complete combustion. Injection of the fuel by compressed air (the original Diesel cycle) is obsolete, and the fuel is pumped through a nozzle at a pressure of from 2,000 to 10,000 lb. per sq. in., the higher pressure being required to give sufficient penetration with large cylinders. Power is regulated by varying the amount of fuel injected, and there is no necessity for throttling the air supply, so that the volumetric efficiency remains high at all loads.

Engines can be sub-classified as (1) single acting four-stroke; (2) double acting four-stroke; (3) single acting two-stroke, and (4) double acting two-stroke. (1) is probably the simplest design to

operate and maintain, but suffers from the disadvantage that only one stroke in four is a power stroke, so that engines of very large powers, running at comparatively slow speeds, as in marine practice, require a number of very large cylinders and occupy an excessive space. The cylinder of a single acting two-stroke has one power stroke per rev., and with the same mean effective pressure would develop twice the power of a four-stroke cylinder of the same size; but problems of cylinder cooling and distortion become much more acute, and for this and other reasons the power increase is only 50-75 p.c. Cam-operated valves are not necessary, but are often fitted in the larger sizes to improve scavenging of exhaust gases. In all but the smallest engines with crankcase compression

a compressor is required for the scavenging air. Adequate scavenging of exhaust gases without undue



Internal Combustion Engine. Two-stroke cycle: crank-case compression

mixing is aimed at in all two-stroke designs, and this is impossible to obtain in the case of a petrol engine without loss of some of the charge through the exhaust port, so that two-stroke petrol engines are appreciably less economical in fuel than four-stroke engines, and are used only in very small sizes, where simplicity is of more importance than economy.

In marine practice saving of space and weight is of the utmost importance, particularly in the case of larger engines developing up to 12,000 h.p., and here double acting engines are frequently adopted. The problems of design and operation are much more acute in such cases, since the heat flow is much greater and the piston, rod, and stuffing-box must be cooled by circulating oil or water through them. A number of different designs of both four-stroke and two-stroke double acting engines of the compression-ignition type are in use, but conditions of operation vary so much that definite conclusions are difficult to draw regarding the most suitable type for a specified purpose. Other problems which have given trouble are the balancing of reciprocating parts, torsional vibrations of shafting, and vibration of engine supports due to variations of torque on the crank-shaft (torque reaction). Double-acting engines have much heavier reciprocating parts than single-acting engines of the same type, but the crank-shaft is shorter with fewer cylinders and torque reaction effects are less, owing to greater uniformity of torque.

The fitting of a flywheel tends to smooth out variations of the torque

transmitted to the driven shaft. The flywheel effect of the rotating parts of the engine and in some cases of the driven member (e.g. a generator) are often quite substantial and reduce the necessary size of the flywheel.

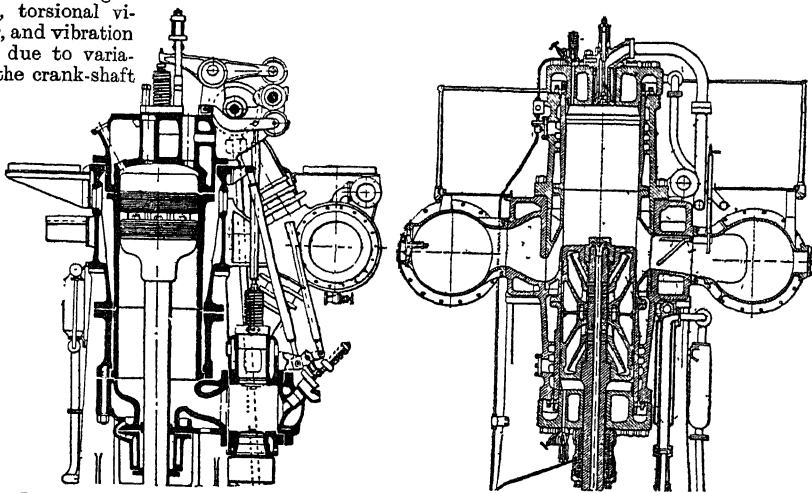
The mean effective pressure (and hence the power) which can be developed in a cylinder depends upon the weight of air in the cylinder at the end of the induction stroke. This weight can be increased by supercharging, i.e. forcing air into the cylinder at a pressure higher than atmospheric. This, of course, is common practice with aero engines, the object being to maintain the power at high altitudes. In marine practice the object of supercharging is to save space and weight by obtaining more power from a given size of cylinder. A turbine operated by the exhaust gases is used to drive a blower which increases the pressure of the air supplied to the engine, and by this means the engine power may be increased by from 50 to 60 p.c. Problems of heat dissipation, etc., are accentuated by this method.

The starting of large engines is usually effected by means of compressed air stored in reservoirs charged by an independently driven air compressor. Special starting cams are fitted to the camshaft which, when brought into action, convert the engine into a compressed air motor. At a sufficiently high speed the starting cams are disengaged and the working cams engaged, and the engine continues to operate.

In the combustion turbine, a competitor with the reciprocating engine, air is compressed by a

rotary compressor into the combustion space. Fuel is then injected and burned at constant pressure, the high temperature products of combustion being discharged through a turbine on the same shaft as the compressor. Part of the work done by the turbine is expended in driving the compressor, and the remainder is available for external work. The idea is by no means new, but developments in the past have been retarded by the low mechanical efficiencies of both compressor and turbine, coupled with troubles with materials at the high pressure end of the turbine. For instance, if the mechanical efficiencies of both compressor and turbine are 100 p.c., the compressor might take 40 h.p. and the turbine might generate 120 h.p. altogether, giving a net output of 80 h.p. If, however, the mechanical efficiency of each is only 60 p.c., the compressor would require 67 h.p. and the turbine would generate 72 h.p., giving a net output of only 5 h.p. Intensive research and experiment, coupled with the discovery of new heat-resisting materials which allow the use of higher maximum temperatures, have made mechanical efficiencies of over 85 p.c. practicable, together with a high maximum temperature, on which the thermal efficiency of the combination also depends, so that thermal efficiencies of over 30 p.c. may be reached in large sizes, which compares favourably with that of the reciprocating engine. (See Gas Turbine.)

For aircraft, the sizes of compressor and turbine are so adjusted that the turbine supplies just



Internal Combustion Engine Double-acting oil engines: two-stroke on left, four-stroke on right

sufficient power to drive the compressor and the reaction of the exhaust gases issuing at a high velocity is utilised for propulsion.

Internal Standard. A metallurgical term. In spectrographic analysis it is necessary to measure the density of blackening of a photographic plate by a particular spectrum line. Since the position of the spectrum line is peculiar to the element concerned and the density of the line is proportional to the amount present, both qualitative and quantitative analyses are possible. Errors caused by plate variations can be reduced by employing an internal standard, *i.e.* a line due to the major element present and comparable in density to the line due to the element to be determined. Plate variations, differences in exposure time, development, etc., will then affect both lines equally, without altering the relative densities.

International. In sport, term for a contest between the representatives of two or more countries; and by extension, a player in such an event. Such a contest may be open to the world: the Olympic Games (*q.v.*), for athletics and for other amateur sports, and the Davis Cup (*q.v.*), for amateur lawn tennis, are two outstanding examples. Other categories of international are open to a small group of countries. There are the annual Association football series, for which England, Scotland, Wales, and Ireland compete, and the similar Rugby championship, to which France is also admitted. Internationals restricted to two nations are cricket test matches (*q.v.*), for which one country sends a team to tour another; and the Anglo-U.S.A. golf matches—the Ryder cup for professionals, the Walker cup for amateurs. Women's international matches become increasingly numerous.

International, THE. Name given to three series of congresses attended by socialist and communist delegates of many countries, and to the organizations supporting and being supported by them. The first international developed from the international working men's association, founded in 1864 by Marx and Engels as a revolutionary body to work for the aims of their communist manifesto of 1848. These aims included the abolition of private property in railways, mines, and land, the state ownership of factories and instruments of production, the public education of all children and the abolition of child factory

labour, the abolition of inheritance, and high and progressively graded income tax. The first international held congresses at Geneva, 1866, Lausanne, 1867, Brussels, 1868, Basle, 1869, The Hague, 1872, and Philadelphia, 1876.

The Commune rising in Paris in 1871 caused hopes to rise high; the collapse of the Commune brought a commensurate decline in the first international, within which there was dissension between the evolutionary socialists and the revolutionary communists. This culminated in the expulsion of the Russian anarchist Bakunin, who formed a rival international which operated principally in Spain and Italy until 1879.

The Second International

During the 1880s the labour and socialist movements revived and made substantial progress, particularly in Germany, Austria, and France, and the opening of the world exhibition in Paris, 1889, provided the stimulus for the formation of the second international. Its first world congress met in Paris, July, 1889. Subsequent congresses were held in Brussels, 1891; Zürich, 1893; London, 1896; Paris, 1900; Amsterdam, 1904, when the British labour party took part; Stuttgart, 1907, when the women's international was established; Copenhagen, 1910; and Basle, 1912. In 1900 a permanent international socialist bureau (I.S.B.) was established at Brussels.

The second international attracted such later outstanding men as Lenin, Mussolini, Briand, Ramsay MacDonald, Liebknecht, Laval, Vandervelde, Pilsudski, Bernard Shaw; but internal strife between evolutionaries and revolutionaries continued. Finally, at the London congress, 1896, the anarchists were expelled. The Amsterdam congress, 1904, resolved that there should be only one socialist party in each country; but the Russian Bolsheviks, who were revolutionaries, refused to be reconciled to the Mensheviks, who believed in collaboration with liberal opposition parties.

When Austria-Hungary declared war on Serbia in July, 1914, the I.S.B. called an international congress on Aug. 9 in Paris to discuss war and the proletariat. It decided that workers everywhere should demonstrate against war and demand arbitration. But the socialists of Germany, France, and Belgium voted war credits. Only Liebknecht in the German Reichstag and the Bolsheviks in the

Russian duma refused. Revived in 1919, the second international secured the adherence of the moderate sections of most socialist movements, including the British Labour party. It decided to rely on parliamentary action only. Various congresses were held during the inter-war years.

In March, 1919, Lenin founded the Comintern (short for *Communist international*) or third international, based on Moscow. It admitted only revolutionary Communists, and its aim was to fight "by all available means, including armed force, for the overthrow of the international bourgeoisie and for the creation of an international Soviet republic as a transition stage to complete abolition of the state." It held congresses in Moscow in 1919, 1920, 1921, 1922, 1924, 1928, and 1935. The 29 conditions it set for membership of a Communist party were most stringent requiring, among other things, active Communist propaganda among civilians, in the services, and within trade unions, ruthless purging of all reformists, illegal as well as legal organizations for subversive work, and agitation to uphold constantly the ideal of the dictatorship of the proletariat. Zinoviev was chairman from 1919 until 1926; Bukharin succeeded him until 1928, when the gen. sec. was made the chief official, Grigory Dimitrov being the first gen. sec.

Dissension in the Comintern

The Comintern in its early years was not free from dissension. One group, led by Trotsky, urged the need for permanent revolution in other countries in order to maintain the Soviet regime; the other, led by Stalin, claimed that Russia by her own efforts could establish socialism. Stalin's view prevailed, the sixth world congress, 1928, recognizing the need for affiliated Communist parties to cease promoting world revolution and to concentrate entirely on defending the Soviet Union. At the seventh congress, 1935, Dimitrov advocated the creation of a united front of all socialist and liberal parties in other countries in order to stem the rising flood of fascism. With Russia's entry into the war the Comintern, on account of its origin rather than on account of its policy at that time, became a liability instead of a help to the U.S.S.R., and it dissolved itself May 15, 1943. A new international body, Cominform (*Communist information*), representing at its initial meeting the Communist

parties of Russia, Poland, Rumania, Hungary, Yugoslavia, Czechoslovakia, Bulgaria, France, and Italy, came into existence at Belgrade in Oct., 1947. See *Bolshevism*; *Commune*; *Engels*, Friedrich; *Huysmans*, Camille; *Labour*; *Lenin*; *Marx*, Karl; *Socialism*; *Stalin*; *Trotsky*; *U.S.S.R.*; *Vandervelde*, Émile.

International Affairs, ROYAL INSTITUTE OF. Unofficial and non-political organization founded in London in 1920 to encourage the unbiased study of international questions. The institute promotes the science of international politics, economics, and jurisprudence, and the study of literature on these subjects. It organizes research into international problems by individual scholars, and maintains study groups of experts. Since 1924 it has published a monthly journal, originally called the *Bulletin of International News*, renamed 1945 *The World Today*; and since 1922 a quarterly, *International Affairs*. During the Second Great War a research organization was set up for the British foreign office and discussion courses were arranged for the forces. Its head office is at Chatham House (*q.v.*), St. James's Square, S.W.1. It also has offices in Sydney, N.S.W.; New Delhi, India; Johannesburg, S. Africa; and New York, U.S.A.

International Bank FOR RECONSTRUCTION AND DEVELOPMENT. Organization provided in the recommendations of the Bretton Woods conference of 44 nations held in 1944. An original nominal capital of ten thousand million American dollars was to be subscribed by all member states according to an agreed quota. Its purpose is to assist by loans and guarantees the reconstruction and development of territories devastated by the Second Great War; the development of productive resources of less advanced countries; and the encouragement of international investment. The principle is that, since the world must benefit from the increased productivity of any part, all commercial nationals should share in the risk of financing such development. Assistance may be given to states or to private enterprise. See *Bretton Woods*.

International Brigade. Military organization of foreign nationals who fought for the republican government in the Spanish Civil War (*q.v.*). The brigade first went into action at the defence of Valencia in Nov., 1936.

At maximum strength it numbered about 30,000, representing some 30 nationalities. British subjects formed two battalions, one called the Clement Attlee battalion, and 543 of them were killed in action. Upon the non-intervention agreement of 1938, the International Brigade was disbanded on Sept. 28.

International Court of Justice. One of the achievements of The Hague peace conference of 1899 was the establishment of a permanent court of arbitration. This was not a court in continuous session, but a panel of arbitrators from which the parties to a dispute could select a tribunal. It still exists, although since 1914 the need to resort to it has lapsed. In 1922 there was established under the League of Nations, the permanent court of international justice, with jurisdiction to decide all disputes voluntarily submitted to it by states. With the dissolution of the League this ceased to exist. Its place was taken, and its work continued by the international court of justice created 1945 under the United Nations charter. This court may pronounce upon matters of international law submitted to it by the organs or members of the United Nations.

Internationale, L' International anthem of the Communist parties and, until Dec. 19, 1943, national anthem of the U.S.S.R. The original words were written in French in 1871 by Eugène Pottier, and set to music about 20 years later by Pierre Degeyter, a Lille artisan. The first verse of the English version reads:

Arise, ye starvelings, from your slumbers;

Arise, ye prisoners of want!

For reason in revolt now thunders

And at last ends the age of cant.

Now away with all your superstitions;

Servile masses, arise, arise!

We'll change forthwith the old conditions—

And spurn the dust to win the prize.

Refrain

Then comrades, come rally

And the last fight let us face;

The Internationale

Unites the human race.

International Falls. City of Minnesota, U.S.A., the co. seat of Koochiching co. It is on the S. bank of the Rainy river, the boundary between the U.S.A. and Canada, and is served by rlys. and an airport. It is the headquarters of branches of the international border patrol having charge of immigration and customs inspection, also a port of entry. The Minnesota and Ontario Paper Co. built here in 1916 the world's first mill for making

insulate, a wood-fibre board for insulation. There are lumber mills, and newsprint is produced. Koochiching Falls provide 25,000 h.p. for the mills. The place was settled in 1731, and became a city in 1910. Pop. 5,626.

International Labour Organization. International body which aims at securing common action by member states on matters affecting labour. Originally set up by the League of Nations under the treaty of Versailles, it operated through an autonomous International Labour Office financed by the League but independent of it from an executive point of view. The first meeting was held at Washington in Oct., 1919, and there the International Labour Office was constituted, Albert Thomas of France being appointed director. Permanent headquarters were at Geneva, where annual conferences were held until the Second Great War. The staff was then mostly transferred to McGill university, Montreal, whence it returned to Geneva in 1946.

Every member of the League was entitled to send four delegates to each conference: two on behalf of the government, one of the employers, and one of organized labour. The governing body of the organization numbered twelve, six to represent the employers and six the workers; eight of these came from major industrial powers, including Great Britain, Canada, and India. Non-members of the League could belong to the organization, and the U.S.A. took part in all conferences from 1933. Germany withdrew on leaving the League, but Italy and Japan remained.

The position of the organization became somewhat anomalous with the winding up of the League in 1946, but the charter of the United Nations made provision for bringing such "specialised agencies" within its scope. Soviet Russia had violently attacked the I.L.O. in 1944, because of its former association with the League and of the representation of employing interests on the governing body. Nevertheless, the new constitution was approved in Paris in Nov., 1945, and the membership raised to 48 states. The governing body, now 16 strong, set up international committees for the transport, mining, iron and steel, engineering, textile, oil, and building industries. At conferences, conventions on conditions of employment are proposed,

and adopted for recommendation if supported by a two-thirds majority. Members are then bound to submit the recommendations to their govts. for legislation within twelve months. Those adopted by a govt. must not be revoked within ten years. The I.L.O. also acts as a centre for industrial information. In Great

Britain the minister of Labour deals with international labour policy. By 1942 the international labour conferences had adopted 67 conventions and 882 ratifications had been secured, especially on matters concerning unemployment and the conditions of merchant seamen. Expenditure for 1945 was about £670,000.

INTERNATIONAL LAW: ORIGIN & SCOPE

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Regulation of the relations between states is an ancient idea which has been reformulated through the ages. Here is its history, and an account of the current scope of international law. See also Blockade; Embargo; Geneva Convention; Gentili, Alberico; Grotius, Hugo; International Red Cross; Reprisal, etc.

The phrase international law was first used by Jeremy Bentham in the *Principles of Morals and Legislation*, 1780, to denote the legal relations between sovereign states. The concept, however, is far older than that, and in its modern form derives from the political, economic, and social changes of the Renaissance.

A detailed code of ceremonial relationships existed between the city-states of ancient Greece. These related to such matters as the privileges and inviolability of heralds, the proper causes of war and the proper method of declaring war, the treatment of prisoners, and the construction of treaties. Similar usages governed the relations between the ancient kingdoms of India and of China.

Medieval Chivalry

The kingdoms of medieval Europe followed a common set of ceremonial observances, defining the status and privileges of envoys and heralds, the mode of concluding treaties and the sanctity to be attached to them, and in addition, governing the conduct of war, the treatment of prisoners, their ransom, and the permissible measures which could be taken against towns that surrendered and those that were taken by assault. These medieval rules were evolved in large part from the rules of chivalry of Western Christendom, which was regarded as a single society whose twin heads were the emperor and the pope.

The Renaissance and the Reformation destroyed this conception of medieval Christendom as a single society. The Reformation split it in the religious sphere, and in the nations which followed the reformed religion either the ruler or parliament arrogated to itself the right to determine religious belief. Moreover, the age of discovery brought the nations of

Western Europe into fairly close contact with non-European peoples of non-Christian religion, and, even in Western Europe, the emergence of new nation states, such as England, France, and Spain, coincided with very considerable extensions in the power of the rulers of those states, both internally over their subjects and externally in their foreign relations. Further, the older system of feudal warfare, in respect of which the medieval rules had been developed, had been replaced by the warfare of mercenary armies, which accepted few restraints upon their activities in relation to the civilian population; and the wars of the 16th century were in general waged with great savagery and few restraints, whilst the Thirty Years' War (1618-1648), in which at one time or another all the nations of Europe were involved, gave rise to miseries so great that there was a general recognition of the necessity for defining the conditions which states should observe in war.

Post-Reformation Doctrine

Some writers of the 16th century, generally known as the Spanish school, advocated the re-establishment of the medieval system, with modifications. Their writings failed to win general acceptance, however, for the nations which had embraced Protestantism rejected the authority of the pope and of the canon law. Moreover, after the Renaissance even Catholic rulers rejected external limitations upon their sovereignty, at any rate in the political sphere. What was needed, therefore, was a body of doctrine which would take as its starting-point the sovereign independence and equality of the states.

The founders of this new science were Alberico Gentili (1552-1608) and Hugo Grotius (1583-1645).

After obtaining his doctorate in law, Gentili was appointed to judicial office, but was compelled to leave Italy because his family had embraced Protestantism. He took refuge in England in 1580, and settled in Oxford. Seven years later, he was appointed regius professor, and the government consulted him frequently upon international questions. His treatise upon international law, published shortly after the destruction of the Armada, is the starting-point of the modern concept. Gentili constructed his rules primarily from the recent practice of states. He also departed from the practice of all his predecessors by admitting non-Christian nations within the community of nations governed by the rules of international law (or, as he termed it, the law of nations).

System of Grotius

The work of Gentili considerably influenced his better-known successor, Grotius, usually styled the father of international law. Grotius took his doctorate in law in 1597 at the age of 14. At 15 he became a member of the Dutch embassy to the French court, and in 1604 he was appointed advocate-general of the Netherlands. He later became involved in the religious and political controversies of his country, was imprisoned, but escaped, 1620, to France, and subsequently to Sweden. His great work, *De Jure Belli et Pacis*, was published in 1625, during the Thirty Years' War, the barbarities of which he denounces in the strongest terms. Like Gentili, Grotius appeals primarily to the practice of states, but he also makes fuller use of rules of natural law, and even of illustrations drawn from classical antiquity and from the Bible.

With the inauguration of a new European system at the peace of Westphalia, 1648, the Grotian system of international law can be considered as firmly established. This system accepted as its starting-point the sovereign independence and legal equality of states. Their obedience to international law therefore depended upon their consent which, once given, was regarded as incapable of being withdrawn. Thus it followed that international law sought to invest treaties—the formal written undertakings of states—with special sanctity, for unless reliance could be placed upon the pledged word of states, the whole system collapsed. It also followed that the absence of any superior coercive authority

implied that international law must necessarily accept the fact of war between states—that is to say, as the ultimate method of settling international disputes. The most that international law could do was to seek progressively to ameliorate the conditions of warfare by the elaboration of rules acceptable to all nations on the basis of reciprocity. Thus international law was an imperfect law in the sense that it lacked the compulsive force of an impartial superior authority. It was also a law of extremely limited function, though within those narrow limits the rules were clear and, at any rate as far as the laws of peace were concerned, they were generally followed.

THE LAW OF PEACE. The only subjects of international law are states. An individual as such has no existence in international law, although he may be the medium by which his state acquires or loses rights. The first question in international law is therefore to determine what communities are entitled to international personality, how they come into existence, and how international existence is lost.

Oriental Nations Accepted

A state becomes a personality in international law through the general recognition of it by other states. Thus, in the 19th century, the oriental nations were progressively admitted within the society of nations governed by international law. Further, the existence of a state is in no way prejudiced by changes in its government or territory. On the other hand, a state obviously loses its international personality where it is completely annexed by another state. Important and delicate problems arise where a portion of a state revolts and maintains organized hostilities against the parent state. Other states may here recognize a state of belligerency, conferring on the rebels the rights of a belligerent, and the limited international personality necessary to sustain these rights. The question of the recognition of belligerency was of very great importance during the American Civil War (1861-1865). If the rebellion is successful, then third states have to decide when the time has come to recognize that independence has been achieved, in this way recognizing that a new state has come into existence.

A state owns property, the most important of which is the territory over which its authority extends. Such territorial property may be acquired in various ways,

for example, by occupation, conquest, cession, or accretion. Title by occupation was of great importance when new areas were being discovered and settled; the conflicting claims to areas of the Antarctic continent are a more recent example under this head. Occupation, to be valid in international law, must be continuous and effective, though what constitutes effectiveness may vary. Thus, in the 19th century it was doubted whether the Antarctic could be effectively occupied; the general consensus of international opinion in the 20th would seem to be that it can.

The Effects of Conquest

Conquest sets up a title which in the first instance depends upon superior force. Later, it acquires a quasi-legality through long-continued effective possession. There is, however, no generally accepted rule of prescription, and in consequence titles of long standing may be lost through a change in circumstances, even independently of treaty. Thus, the titles of Russia, Germany, and Austria to Polish territory, acquired in the first three partitions, were set aside by the events of the First Great War.

Cession differs from conquest in that title is derived from a formal treaty, even though the treaty may be itself the result of a successful war, to which the defeated state assents only under duress. Thus, Alsace-Lorraine passed to Germany in 1871, and was returned to France in 1919, by cession. Accretion occurs when new land is added to the territory of a state either through natural forces, or through human effort by reclamation.

The state also has a proprietary interest (though of different degree) in its public ships, whether ships of war or other vessels, and in the merchant ships which fly its national flag. This gives the state jurisdiction over persons in those vessels, and over acts done upon them. In general, the sea cannot be the subject of proprietary claims by any state; but all states exercise jurisdiction over maritime water, i.e. seas adjacent to their territory, although the extent of this jurisdiction is not generally agreed. Originally, it was a distance of three m. from the shore, with extensions to cover deep bays and inlets.

A state exercises jurisdiction over all persons situate on its territory, with some exceptions. Thus, foreign sovereigns and the diplomatic representatives of foreign states (and many classes of

officials of the United Nations organization) are exempt from local jurisdictions. Moreover, by international practice extensive immunity is also conceded to the public vessels of foreign states.

Where two states are involved in a dispute there exist several peaceful methods of settling the dispute independently of any machinery established by the United Nations. Initially, an attempt will be made to settle the dispute by ordinary diplomatic methods. These failing, the contesting parties may submit the dispute to arbitration or to settlement by an international judicial tribunal. From 1898, many states have signed arbitration treaties, agreeing to submit all, or some classes of, disputes arising between them to the decision of an arbitral tribunal. Following the establishment of the League of Nations, there was set up in 1923 a permanent court of international justice, with nine judges and six deputy judges, selected from the world's most distinguished international lawyers, for the decision of all cases which nations chose to submit to it. Following the Second Great War, this court was reconstituted as the world court of international justice. Like its predecessor, the court has only a limited jurisdiction, exercised mainly for the determination of doubtful points under treaties or for the declaration of rights under international law. Decisions on major political controversies between nations lie with the security council of the United Nations.

Pacific Blockade and Reprisals

Should arbitration fail, or not be sought, one of the disputants may put constraint upon the other in order to compel it to give satisfaction. Such measures are pacific blockade, reprisals, or an embargo upon the commerce of the opponent. Should all these measures prove ineffective, then, before 1919, the only remaining action possible was a resort to war.

THE LAW OF WAR. The branch of international law governing the relations of states which are at war has been frequently subjected to criticism, more especially since (i) the successive developments in the methods and weapons of warfare have made it necessary progressively to modify the rules, and (ii) experience has shown that in major wars, involving great powers struggling for survival, there is a distinct likelihood that a state in danger of defeat will violate the laws to secure a new advantage.

Grotius discussed the laws of war for the purpose of standardising state practice, and also for the purpose of cautiously suggesting certain *temperamenta*, or modifications, by means of which practice could be softened. In general, the rules as so defined were followed by the European nations in the wars of the 18th century. Even in the century between 1815 and 1914 there was sufficient community of interest between the European powers to secure the observance of the rules as then understood, and also to secure such ameliorations as the general acceptance of the Geneva convention, 1864, with the immunities which it conferred upon medical services operating under the Red Cross.

The Hague Conventions

Finally, at The Hague peace conferences of 1899 and 1906, a series of conventions was drafted, to which the majority of states adhered, governing many of the incidents of warfare, such as the granting of days of grace to enemy merchant ships in port at the outbreak of war, the treatment of prisoners of war, the use of poison gas, the bombing of undefended towns, and the laying of mines in the open sea. These rules failed to withstand the stress of the major war of 1914-18. At various times between the First and Second Great Wars, efforts were made at international conferences to secure the abandonment of various methods of waging war, e.g. by unrestricted submarine warfare, or by the bombing from the air of open towns; but these rules were disregarded in the Second Great War. Nevertheless, some rules, such as those governing the treatment of prisoners and wounded, stood the test of total warfare somewhat better than rules seeking to prohibit the use of certain methods of warfare, although the Second Great War showed a very serious retrogression on the part of Germany so far as the treatment of the civilian population of occupied territories was concerned.

THE LAW OF NEUTRALITY. When a state of war exists between two or more belligerents, those states which do not participate in it must preserve, as far as the belligerents are concerned, the status of neutrality. Neutrality confers privileges, but it also involves obligations. The basic principle of neutrality is that a neutral state, in seeking to preserve its normal relations with the belligerents in time of war, must not, in so doing, assist one of the belligerents in the

prosecution of the war to the detriment of another. Thus, a neutral must not permit the fitting out on its territory of ships of war for the use of a belligerent. In the Alabama arbitration, 1870, the U.S.A. was awarded substantial damages against Great Britain who had permitted the building of the Confederate commerce raider Alabama in a British port during the American Civil War. The sale by the U.S.A. of 50 destroyers to Great Britain in 1940 was justified on the ground that at the date the U.S.A. had proclaimed the abandonment of neutrality in the struggle with Hitler, although she did not become a belligerent until Dec., 1941, and also on the ground that Germany was waging an aggressive war (evidenced by the conquest of Poland) in defiance of the Kellogg Pact, 1928, renouncing war as an instrument of national policy, to which Germany and the U.S.A. were signatories.

Obligations of Neutrals

In conducting his commerce with a belligerent state, a neutral is subject to the rules governing blockade and the carriage of contraband. A neutral may not allow his territory to be used by a belligerent as a base for any form of hostile operations.

INTERNATIONAL LAW IN TRANSITION. For nearly three centuries, international law, as defined by Gentili and Grotius, comprised a body of doctrine of reasonably precise content, accepted and applied by states in their dealings with one another, but lacking the compulsive force of a supernatural authority, and accepting the fact of war as a relation of states. The apparent growth of international law-abidingness in the 19th century led writers to several conclusions:

(i) That with the increasing interdependence of states, and the steady growth of commerce, states would be increasingly reluctant to go to war;

(ii) In consequence, the rules of international law would acquire greater certainty of application because of the general reluctance to go to war;

(iii) On the occasions when wars unhappily broke out, the development of international public opinion and the rapid advance of civilization would be directed towards minimising its impact upon the civilian population, and towards humanising the actual conduct of military operations themselves.

International history since 1914 has shown the fallacy of all these conclusions. Wars between major powers today are totalitarian wars i.e. they involve entire populations. Also successive advances in mechanical ingenuity have coincided with more brutal practices towards opponents than at any recent period in European history.

The League of Nations

The revelation of the inadequacy of the consent of states as the basis for international law, coupled with the desire to eliminate warfare as the greatest scourge to which humanity is subject, the deadliness of which is today a threat to the very survival of the race, has resulted in a new approach to international law. The first requisite for a really effective law is now seen to be the establishment of an effective supernational authority to enforce it, so that a state can be forcibly prevented from going to war if peaceful methods of settling an international dispute have failed. When the League of Nations was established in 1920, it was still assumed that conduct such as that of which Germany had been guilty was exceptional, and that the collective will of law-abiding nations, united by the League Covenant, would be sufficient to restrain a future aggressor. Accordingly, instead of attempting to organize all its forces in the service of peace the League covenant contemplated a general disarmament of nations—an ideal which, in the disturbed inter-war period, no state was prepared to put into practice. Further, no adequate machinery was established for the purpose of settling peacefully the major political claims of nations. These arise from the claims of one state to modify the political status quo in its favour and are often claims to territory which admittedly belongs to another state. Such disputes under the League covenant were to be brought either before the League assembly or the League council, and between states of lesser importance, the League was an effective instrument for peace, but even in pre-League days such disputes had frequently been settled by international conferences. In 1850, for example, the congress of Berlin settled a major dispute between Russia and Turkey involving the development of the Balkans. Where a dispute involved a major power, however (e.g. the Manchurian affair, 1931, and the Italo-Abyssinian War, 1935-36) the League proved

powerless to compel a determined aggressor to accept peaceful methods of settling international disputes. The League failed because states were not prepared to set up an international authority sufficiently strong to override individual national sovereignties with adequate compulsive force.

In the later stages of the Second Great War a second international authority—the United Nations—was established, Oct. 24, 1945, following the San Francisco conference, April–June, at which a charter was drafted and approved. The new organization preserved many of the features of the League, but there were important changes. Power was now concentrated in the security council, of which the five great powers (the U.S.A., the Soviet Union, Great Britain, France, and China) are permanent members and in which they have a preponderant voice. The United Nations charter provided for national contingents to be placed at the disposal of the security council, for use against an aggressor. The charter also contemplated that all future international disputes shall be settled peacefully, either by arbitration, or by decision of the world court (the international court of justice) or by decision of the security council. Like the League, however, the United Nations is an association or confederation of states. It is not, in itself, a superstate, and it does not solve the problem how war can be averted if a great power becomes an aggressor.

One further legal development must be noticed. On the conclusion of the Second Great War international tribunals composed of judges of the victorious powers were set up to try, not only military and other agents of the defeated states who had authorised gross violations of international law and international morality, but also those who had been prominently associated with the preparation and prosecution of aggressive war. Such trials set a precedent. See Nuremberg Trials.

International Law, INSTITUTE OF. Society founded in 1873 for the study of international law. It consists of members and associates, the number of each being limited to 60, and jurists of all nations are eligible for membership. No nation is allowed to have more than one-fifth of the members. In normal times the institute holds an annual meeting in some European city. In 1904 it was awarded the Nobel peace prize.

The International Law Association was founded in Brussels, also in 1873; a deputation of eight members of the above institute taking part in its establishment. This association is not limited to jurists; its present membership exceeds 1,000.

International Monetary Fund. Established under the Bretton Woods (*q.v.*) agreement of July, 1944, ratified by Great Britain in Dec., 1945. The fund, although reckoned in American dollars for convenience, consists of gold, dollars, and to a lesser extent the currencies of other member states. It totals, as originally provided, \$8,800 millions and is held as to 50 p.c. in the U.S.A., where is the principal office, and as to 40 p.c. in Great Britain, the U.S.S.R., China, and France. It is managed by a board of governors.

By drawing on the fund a state may, subject to strict regulations, obtain foreign currencies to balance temporarily those it is receiving from current trade and finance with those it needs to pay for essential imports and services. Thus the quota subscribed by each member is available for much the same purposes as the reserve of gold held formerly by nations adhering to the gold standard. Like gold, a cheque on the fund will always produce more of any foreign currency, thereby enabling trade to continue. But, like the gold reserve, the sum available is not inexhaustible. Therefore any state that is unable to increase exports and thus obtain foreign exchange may devalue its currency by up to 10 p.c. below the established parity. This should stimulate exports. In this respect membership of the fund differs from adherence to an unalterable gold standard.

The conditions in which the fund would work were envisaged thus:

Each nation undertakes to conduct its external currency arrangements according to rules. It must permit free dealings in its currency at all times by all other members, so far as those transactions arise from current trade and normal finance. It must not block funds belonging to foreign nationals. It must accept as the par value of its currency the exchange value ruling on the sixtieth day before its joining the fund, and must not, except as indicated above, thereafter alter that value. It must avoid competitive alterations in exchange rates such as were frequently made before the Second Great War in an endeavour to obtain a greater share of foreign trade. Nations are

intended through their representatives to collaborate upon international monetary problems.

By divorcing current exchange transactions from those arising from large and prolonged capital movements, it was hoped that the latter would not lead to such exchange disturbances as constituted a major cause of trade depression between the Great Wars.

International Red Cross. Organization for the relief of war victims. A strictly neutral body, acting on behalf of all signatories of the Geneva Convention impartially, it seeks to extend the Red Cross movement to all countries:

to notify to existing signatories the constitution of new Red Cross societies; to induce all civilized states to adhere to the Geneva Convention; and to act as neutral intermediary between governments and Red Cross societies. Its committee strives to assist prisoners of war materially, morally, and intellectually, to visit their camps, and report to the governments concerned on their conditions. Since 1919 protection has been extended to civilian internees.

The International Red Cross movement originated in 1863, when a Swiss, Henri Dunant, horrified by what he had seen on the battlefield of Solferino, organized a conference attended by experts from 36 powers. The Geneva Convention was accepted by 26 powers on Aug. 8, 1864, laying down certain principles to be observed in war: the wounded to be respected; military hospitals to be neutral; and medical personnel to be protected. The symbol of the Red Cross was adopted, being an inversion of the Swiss flag. The provisions were later extended to the crews of ships at sea.

The committee gave relief to the wounded during the Franco-Prussian War of 1870, the Russo-Turkish war of 1877, and the Balkan wars of 1912–13, in which for the first time it took up the question of prisoners of war. In the First Great War, P.O.W. relief became the committee's first concern: it set up an agency in Geneva, with a card index of seven million names. Another convention relative to prisoners of war was ratified by 44 states (excluding Russia and Japan) in 1929. The committee was active in the Gran



International Red Cross Society's flag

Chaco war, the Abyssinian war, the Spanish Civil War, and the China-Japanese conflict. In Sept., 1939, it opened a central P.O.W. agency, and offered its services impartially to all belligerents. By 1945 its card index had 39 million names, 60 million letters had been forwarded, and relief furnished valued at 3,400 million Swiss francs. The committee received the Nobel peace prize in 1918 and 1944. For conventions of 1949 see Geneva Convention in N.V.

International Settlement. A town or port assigned by a country to nationals of other countries for the purpose of facilitating foreign trade. At one time there were some 30 in China, where foreigners could try their own nationals in their own courts, maintain a separate police force, and have a majority in the municipal administration and preferential rights in paying taxes. The chief international settlement was in Shanghai. In 1928 the Chinese national government opened negotiations with the treaty powers for the abolition of the international settlements. On Jan. 11, 1943, Great Britain and the U.S.A. signed treaties with China at Washington surrendering all extra-territorial rights in treaty ports and international settlements, and soon similar treaties were signed by the other countries concerned. There is an international settlement or zone at Tangier (*q.v.*) administered by an international assembly of 27 members. See Treaty Port.

International Signal Code. Method of visual signalling between ships at sea or from ship to shore by coloured flags. The first international code was compiled in 1857 on the initiation of the British board of trade and based upon a system devised in 1803. See Signalling.

International Trade Organization. See N.V.

International Units. Units of measurement accepted by scientists of various nations so as to enable results of research, etc., to be presented in a uniform manner and related to identical standards. Generally the units are those of the C.G.S. (centimetre-gramme-second) system. Here the basic units are the centimetre (length); gram (mass); and second (time). The international bureau of weights and measures adopted the "international prototype metre," represented by a platinum-iridium bar engraved with the length; and the "international prototype kilogramme," represented by a platini-

um-iridium cylinder having the mass of 1 kg. For the time unit, one second is taken as 1/86,400 of the average duration of the "apparent solar day." Official equivalents in British measures are yard, .914399 metre; pound, .45359243 kg. These equivalents were made legal in Britain in 1898.

The difficulties involved in measuring the absolute electrical units as defined theoretically led to an international conference in London in 1908, which adopted physical standards for an ohm and an ampere intended to be equal to 10^9 e.m. units of resistance and 10^{-1} e.m. units of current respectively. The international ohm was defined as the resistance offered to an unvarying current by a column of mercury at 0°C., 14.4521 gm. in mass, of constant cross section, and 106.300 cm. long. The international ampere was defined as the unvarying current which when passed through a solution of silver nitrate in water deposits silver at the rate of 0.00111800 gm. per sec. Other international electrical units were derived from these. In the course of time, however, improved methods of measuring absolute units showed that the physical standards laid down in 1908 were not quite accurate, and from Jan. 1, 1948, the absolute units were reestablished as standard, with the following relations:

International	Absolute
1 ohm	= 1.00049 ohm
1 ampere	= 0.99985 ampere
1 coulomb	= 0.99985 coulomb
1 volt	= 0.00034 volt
1 farad	= 0.99951 farad
1 henry	= 1.00049 henry
1 watt	= 1.00019 watt

An international scale of temperature was adopted in 1927, to conform with the thermodynamic scale as closely as the state of knowledge at the time allowed. Certain basic fixed points were established, ranging from the "oxygen point" at -182.97° C., to the "gold point" at $1,063^\circ$ C.

International units have also been established for biological substances such as vitamins, anti-toxins, antibiotics, etc. If the exact chemical constitution of the substance is known, and if the amount of the substance present can be tested by purely chemical and physical means, the unit can be expressed in terms of the weight of the pure substance. Examples are vitamin B₁ and vitamin C. Frequently, however, the chemical constitution is not known, and sometimes even when it is known the process of physical and chemical analysis is too complicated or

expensive for routine use. In these cases the potency or "activity" of a preparation is tested by noting the effect of a given quantity on living tissues under prescribed conditions. When a technique is found that leads to reliable results, international units of activity based on these biological tests are defined by the Expert Committee on Biological Standardisation of the World Health Organisation and standard preparations are made available through National Control Centres in individual countries.

Internment. In war, the confinement or curtailment of liberty of individuals whose presence in a country constitutes a threat to security or a violation of international law. Troops of belligerents entering neutral territory are forced to disarm and to remain there until the end of hostilities; they are then said to be interned. During the First Great War, Allied troops who in 1914 retreated into Holland were interned there; during the Second Great War airmen who made forced landings in Sweden, Switzerland, and Eire were interned for the duration of hostilities. Prisoners of war escaping into Switzerland were also interned there. Ships of war staying in a neutral port more than 24 hrs., except under stress of weather or damage (when some extension is normally allowed), and merchant vessels remaining in the harbours of hostile countries after the declaration of war are also interned, with their crews. During both Great Wars each side interned civilians of enemy nationality. In 1940 British nationals suspected of being potential fifth columnists were arrested in Great Britain under regulation 18B and confined for varying periods. The term internment was sometimes applied to the confinement in concentration camps of their political opponents and others by the National Socialists in Germany; and is also sometimes extended to cover the confinement of prisoners of war. See Alien; Concentration Camp; International Law; Prisoner of War.

Internode. A botanical term applied to the portion of the stem between two nodes (regions of leaf attachment). The internodes are short in leafy buds but usually elongate to separate the leaves as the bud opens. This elongation is the main cause of growth in length of the shoots. During the opening of flower buds elongation

of internodes seldom occurs and the flower remains compact.

Interpleader (Lat. *inter*, between; Fr. *plaideur*). English legal term. A person who has the custody of goods or money claimed by two or more hostile claimants can make them fight it out, at the same time declaring his disinterestedness and willingness to hand over the property to the successful litigant. This is interpleading, and if he fails to do it he runs the risk of having actions brought against him by both the claimants, one of which he is almost certain to lose.

Interpolation. Mathematical process for obtaining intermediate values of a series of which only particular terms are given. The operation is important for astronomers, actuaries, statisticians, and research workers. Sometimes it is possible to interpolate to the necessary degree of accuracy by mere proportion. For example, suppose it is desired to find the logarithm of 3.82757, and the tables show:

log 3.8275 = 0.5829152,

log 3.8276 = 0.5829265.

The difference for 0.0001 is 0.0000113. By simple proportion a difference of 0.00007 in the number will cause a difference of 0.7 of 0.0000113 in the logarithms, i.e. of 0.00000791; hence the logarithm of 3.82757 will be $0.5829152 + 0.0000079 = 0.5829231$. Most forms of interpolation are not so simple, and mathematicians use special formulae, the calculations being performed by machines.

Interregnum (Lat. *inter*, between; *regnum*, rule). In ancient Rome, name given to the interval between the death of a king or chief magistrate and the election of another. During this interval, the regal office or chief magisterial power was held by an official, called *interrex* (between-king), who was appointed by the patrician members of the senate. The period in German history between 1254 and the election of Rudolph of Hapsburg as king in 1273 is called the Great Interregnum.

Interrogatory (Lat. *interrogare*, to ask). Term of English law. In a civil action in any English court of law or equity either party can, before the trial, obtain permission to put questions in writing which the other party must answer on oath. The questions must be strictly relevant to the issues in the action as disclosed on the pleadings, and must not be in the nature of cross-examination. Interrogatories which are merely leading, i.e. attempts to elicit what the opponent's case is,

questions as to credit, and the like, are not allowed. The party interrogated may decline to answer any question on the ground that the information is privileged, or that the answer would tend to incriminate him. It is the duty of the master and judge in chambers to see that interrogatories are not prolix or oppressive.

Intersex. Term used in biology. In many animals, e.g. mammals and birds, the development of the differences by which we distinguish the two sexes depends upon the action of substances known generally as sex hormones. These substances are made by the embryo as a part of its metabolism, i.e. the totality of its chemical building up and breaking down. The kind of sex hormones elaborated by any embryo depends upon its possession of gonads, or primary reproductive organs, which develop into either testes or ovaries, according to the chromosomal make-up of the fertilised egg. If the make-up is of one kind the gonads will develop as testes, and the presence of these testes, growing normally, will induce the embryo to make male hormones (using the word in a wide sense); if of the opposite kind, the gonads will develop as ovaries, and the embryo will make female hormones.

Development of the characteristics by which we recognize the sex of an individual takes time. For these characteristics to develop normally into those of one sex or of the other, the supply of hormones must be right throughout. If for any reason the supply is interfered with, distorted, or switched from one kind to another at any point during development, the latter will go amiss. Each embryo has the potentiality to develop characters of either sex, and so disturbances and distortions and reversals will produce an adult some of whose characteristics will be appropriate to one sex and some to the other. In this sense an intersex is a sex-mosaic in time, as opposed to a gynandromorph, which is a sex-mosaic in space. Behaviour patterns of one sex are sometimes to be seen in individuals of the opposite sex. But caution should be used in arguing that homosexual behaviour implies intersexual development. See Chromosomes; Gynandromorphism.

Intertrigo (Lat. *inter*, between; *terere*, to rub). Chafing or irritation of the skin produced by friction of two opposed surfaces,

such as may occur in the folds of the thighs and neck, or in the armpits, in young infants. The parts should be well cleaned and dried, and dusting powder applied. The use of irritating soap must be avoided.

Intertype. Machine for setting up (or arranging) words in matrix lines and casting them into slugs—individual solid lines—of letterpress printing type. In principle it is the same as the linotype. It is the result of evolution since 1886, when a machine was designed to eliminate the laborious picking up and later returning by hand of single letters of type from little boxes in wooden trays. As on most type-setting machines, the matrix assembling section is controlled by a keyboard on the typewriter principle. Depression of the keys by the operator, dictated by the words in the manuscript, releases the individual character matrices, better described as dies, from their compartments in a magazine. On release the matrix dies automatically travel to their allotted positions until a complete line of matrices is assembled. The words are automatically divided and spaced by sliding wedges into a line or lines of the required length, although one line may contain more letters or words than another.

The line of matrices when completed resembles a mould, and the operator, pressing a lever, sends it to a compartment into which molten metal is pumped under pressure; this solidifies on contact with the line of matrices, and a line of type in the form of a solid metal bar of words in relief is the result. After casting, the line is trimmed to exact dimensions.

After the line of type has been delivered ready for printing from, the line of matrices is transferred from the casting compartment and an elevator arm descends from the top of the machine and picks up the matrices, leaving the space wedges behind, these being deposited *en masse* in their own magazine. The matrices are released from the elevator and pushed on to a ribbed bar. The method of distributing them into their individual sections in the magazine is in principle not unlike that of a Yale key, inasmuch as the teeth or wards of each matrix are different from those of another letter and correspond with the ribs on the bar. The matrices are suspended by their teeth from this distributing bar, travelling laterally along it, and when a matrix

reaches the full extent of a rib it falls by gravitation into its proper box.

The action of the machine is continuous, *i.e.* while one line is being set the preceding one is being cast and the one before that distributed, and so on. A skilled operator will set 1,000 or more words an hour of the column of a newspaper, and one machine will do the work of four hand compositors. See Linotype; Monotype; Newspaper; Printing.

* F. W. Clulow, Ph.D.

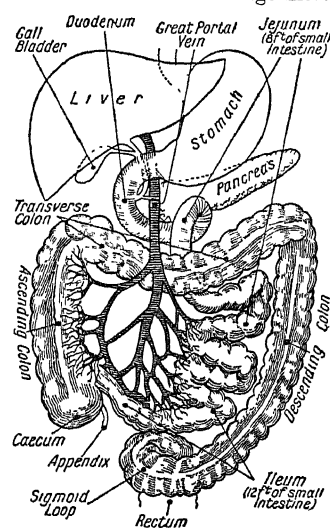
Interval (Lat. *inter*, between; *vallum*, rampart). In music, the difference in pitch between two sounds. Intervals are named numerically according to the number of alphabetical names which they include; thus, C to E is a third, as it includes the three scale-notes C, D, and E; C to G is a fifth, and so forth. Each numerical kind of interval may also vary in quality, as major, minor, etc. Intervals are recognized by the ear as ratios of frequency rather than by differences of frequency. See Harmony; Scale.

Intestacy (Lat. *in*, not; *testari*, to make a will). Legal term for the state of affairs which arises when the owner of a property dies without making a will. It is possible to be partly testate and partly intestate; as where one makes a will which disposes of only part of the property, or where the residuary legatee dies during the lifetime of the testator. On intestacy all property, real or personal, passes according to the following rules: (1) The widow (or widower) takes all personal chattels and £1,000; (2) if the deceased left children, the widow (or widower) takes a life interest on half the balance over £1,000, the other half passing to the children at 21, and the widow's (or widower's) half passing to them, also at 21, on her (or his) death; (3) if there are no children, the widow (or widower) takes a life interest on the whole of the balance which passes to the next-of-kin of the deceased on the widow's (or widower's) death. See Administrator; Inheritance; Will.

Intestine (Lat. *intestinus*, internal). Part of the alimentary canal (*q.v.*). In the human species the intestines are divided into the small intestine—the duodenum, the jejunum, and the ileum—and the large intestine—the caecum, the colon, and the rectum.

The duodenum, leading directly from the stomach, is from 8 ins. to 10 ins. long and roughly horse-shoe shaped, embracing the head of

the pancreas or sweetbread. Ducts from the liver and pancreas enter the duodenum near the middle. The jejunum and ileum are together about 20 ft. long, the jejunum forming the first two-fifths of the canal, and the ileum the remaining three-fifths. The large intestine, extending from the ileum to the anus, is from 5 ft. to 6 ft. in length. The caecum is the blind commencement of the large intestine.



Intestine. Diagram showing construction of the intestinal tube, consisting of the small and the large intestines, each of which is subdivided

time. Entering it is the vermiform appendix, a small blind tube from 3 ins. to 6 ins. in length and about the diameter of a goose quill. The colon is divided into three parts—the ascending colon which passes up on the right side of the lower part of the abdomen, the transverse colon which lies across the front of the abdomen, and the descending colon which passes down on the left side into the rectum, the last is about 8 ins. in length.

The intestines are almost entirely covered externally by a serous membrane—the peritoneum—which, by its attachments to the back of the abdominal wall, the diaphragm, and other organs, keeps the intestines in their place. Beneath the peritoneum is a layer composed of muscular tissue; then follows the sub-mucous coat, and lastly, lining the interior of the canal, the mucous membrane. Throughout the small intestine are a number of small glands called crypts of Lieberkühn, and in the duodenum is a further set called the glands of Brunner. Larger crypts of Lieberkühn are also

present in the large intestine. The surface area of the intestinal canal is very large, being increased by the corrugations of the mucous membrane and, in the small intestine, by small projections of tissue known as villi.

The intestines provide a place for the continuation of the digestive processes begun in the stomach and continued by secretions poured into the canal by the intestinal glands and other organs; and also provide for the absorption of nutritive material from the food as it passes through the intestines—a process assisted by the large surface area of the absorbing mucous membrane. Waste material and undigested food are eventually discharged from the body. These processes are assisted by movements of the intestines. The most obvious of these is a rhythmical muscular contraction which passes along the intestine as a wave and is known as peristalsis. This movement appears to average about an inch per minute. There is also a pendulum or swaying movement which occurs at regular intervals of 5 or 6 secs. which causes a side-to-side movement of the intestines, and helps to mix thoroughly the contents of the canal.

Perforation of the intestine may be the result of ulceration in typhoid fever, tuberculosis, penetrating wounds, and, in the large intestine, of chronic obstruction or cancer. Rupture may follow violent blows, being run over by a vehicle, etc., a condition usually associated with severe shock, pain, and vomiting. Immediate operative treatment is indicated as soon as the diagnosis is clear, the object of the surgeon being to close the wound in the intestine and wash out any blood or intestinal contents which may have entered the abdominal cavity. See Alimentary Canal; Appendicitis; Colic; Colitis; Digestion; Dysentery; Dyspepsia; Hernia; Intussusception.

Intonation (late Lat. *intonare*, to sing according to tone). In music, the introductory notes of a plainsong melody; also, correctness of pitch. For example, if a singer is well in tune, his intonation is said to be good; just intonation is the agreement of scale-tones and intervals with acoustic laws. See Accent; Acoustics; Cadence; Harmony; Singing; Voice.

Intoxication (Lat. *in*, in; *toxicum*, poison). Literally, the condition of being poisoned. It is used occasionally by medical men to describe the condition caused by

the poisons of infectious diseases, but most often to describe poisoning by alcohol. See Alcoholism; Delirium Tremens; Drunkenness.

Intra-Coastal Canal. Inland federal waterway along the Atlantic and Gulf coasts of the U.S.A. Providing a protected channel for barges and light-draft vessels through approximately 2,750 m., it was mostly constructed between 1932 and 1941. Its principal divisions are from Boston to Miami; from Apalachicola Bay, Fla., to the Mississippi at New Orleans; and from the Mississippi to Corpus Christi, Tex. The canal, which has a depth of 12 ft., was built through a right of way 300 ft. wide granted free of charge to the government. It has the subsidiary purposes of irrigation and reclamation.

Intra-Mercurial Planet. Hypothetical planet revolving round the sun in an orbit inside that of Mercury. Such a planet would be difficult to detect because it must necessarily keep close to the sun. It might, however, be seen passing across the sun's disk or during total eclipses. In 1859 Lescarbault claimed to have seen a black circular object crossing the sun in circumstances which led to the naming (Vulcan) of the supposed interior planet, but the observation is now regarded as spurious. In 1878 Watson and Swift claimed to have seen during a total eclipse an intra-Mercurial planet, but this too has never been seen since. Photographs taken during recent eclipses show no object within 12° E. and W. of the sun which cannot be identified as a known star. It is virtually certain that there is no intra-Mercurial planet brighter than the eighth magnitude.

Intrinsic Energy. The internal energy associated with a substance, a definite amount under given conditions. This energy may be partly released if the substance takes part in a chemical reaction. In any reaction the sum of the intrinsic energies of the substances undergoing change is different from the sum of those of the substances formed. If heat is liberated thereaction is exothermic; if absorbed, endothermic.

Introit (Lat. *introitus*, entrance). Portion of a psalm or an antiphon sung at the beginning of the mass. The introit is part of the ordinary of the mass, varying with the seasons and the festivals of the ecclesiastical year, and from early times the masses have been designated by the first words of their

proper introits. In the Church of England the word is employed to describe the psalm or hymn sung by the clergy as they enter the chancel before the Communion service. See Mass.

Introjection. A psychological term, meaning the process of taking unconsciously into the mind beliefs or attitudes possessed by persons who are regarded as unquestionable authorities. Children absorb many habits and opinions of their parents, especially while the conscience is being nurtured. In adolescence, what is believed of heroes and favoured causes is taken into the mind in the same way, to be rejected in whole or in part when the hero is discarded. The same mechanism operates in passionate love. Introjection is irrational in character and largely automatic. The only defence against it is reason, which unfortunately is more often used to excuse the opinions arrived at than to modify them.

Intromission (Lat. *intro*, within; *mittere*, to send). In Scots law, term applied to interference or dealing with the property of another. It is either lawful, as when an agent acts on behalf of his employer or a collector on a judgement or order from a court; or vicious, as when someone not duly appointed executor proceeds to deal with the estate of a deceased person. In such a case the intromitter incurs legal liability.

Introvert. Word chosen by Jung to describe one of the main psychological types into which he divides humanity. It is contrasted with extrovert. The introvert's interest is turned for the most part upon his own thoughts and feelings; his reactions to environment are more important to him than the environment itself. Fantasy plays a large part in his life. Examples are found among artists and mystics; the extreme case is the sufferer from *dementia praecox*. The extrovert is more interested in his surroundings than in himself, and tries to alter them to his liking. This theory omits many aspects of the mind, for most men are introverts in some respects and extroverts in others.

Intrusive Rocks. One of three classes into which igneous rocks are divided. They are those rocks which have been forced or injected into veins, fissures, etc., beneath overlying rock masses. See Igneous Rocks; Rocks.

Intuition and **INTUITIONISM** (Lat. *intueri*, to look at). Etymologically, the act of looking at a

thing, the exercise of the faculty of sight. The original meaning has been extended to all sense-perceptions and generally to all knowledge obtained directly. We see a horse and that is enough; the sensation is immediate. No doubt it is really the result of more or less complicated physical processes and reasonings, but these take place so rapidly that they are unnoticed. The word is also used for a kind of spiritual instinct or inspiration, which enables its possessor to grasp at once the highest truths.

The term intuitionism is applied to the doctrine, specially insisted upon by the Scottish school, that there are certain truths which are immediately apprehended without the exercise of reason. Ethically, it is the doctrine, of which James Martineau is the chief representative, that we have an intuitive apprehension of moral values. Moral judgement is based upon "the inner springs" of an action, and we are sensible of a graduated scale of excellence for our moral principles. See Logic.

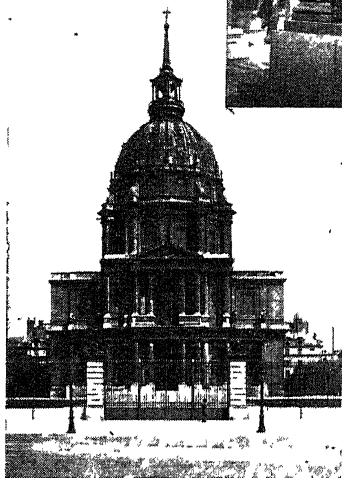
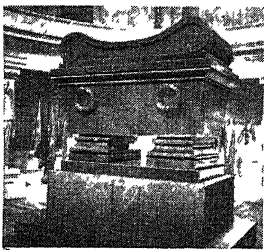
Intumescence. Property possessed by some substances, when heated, of swelling, bubbling, and spurting out, sometimes violently. Minerals which fuse with intumescence generally contain some volatile constituent, often water: e.g. many zeolites. The reaction is important in mineralogy.

Intussusception (Lat. *intus*, within; *suscipere*, to take up). Medical term for the infolding of one part of the intestine into another. The condition occurs most frequently in male infants under two years of age and is the commonest cause of intestinal obstruction. It comes on suddenly with severe pain, followed by vomiting and often diarrhoea. If unrelieved the patient will die within 24 hours to a week. The normal position of the bowel may sometimes be restored by inflating the intestine with air or injecting an enema of warm water or oil, but nearly always immediate operative treatment is demanded. A chronic form may occur in the aged.

Inulin. Substance resembling starch in appearance, and first prepared by Rose in 1804 from the roots of elecampane (*Inula helenium*). Dahlia tubers contain 10 p.c. of inulin and this carbohydrate is obtained from them.

Invalides, HÔTEL DES. French institution for wounded soldiers. Established by Louis XIV in 1670, the building was designed by Libéral Bruant and erected at the N.W. of the Champ de Mars,

Paris. Napoleon re-endowed the institution in 1811, providing for about 7,000 wounded soldiers, but the numbers residing there since then are very much smaller. The hôtel proper is built round a large quadrangle and



Hôtel des Invalides, Paris, containing Napoleon's sarcophagus (top)

contains a magnificent collection of armour and weapons and a comprehensive Napoleonic collection. At the rear is the dome, built by Mansart in 1693, for a royal mausoleum. The remains of Napoleon, brought from St. Helena in 1840, were deposited here in a porphyry sarcophagus in 1861. See Napoleon; Paris.

Invasion (Lat. *in*, in; *vadere*, to go). Act of an army in forcibly entering a country. It may precede a declaration of war, when it is a *casus belli*, or may follow one. See International Law; War.

INVASIONS OF BRITAIN. Throughout history numerous attempts have been made to land troops on the British mainland, but most of them, notably those of the Saxons in the 4th century and of the Danes in the 8th-9th centuries, were merely long series of large-scale raids, the invaders never attacking in great strength. Those who did establish themselves were unable to do more than set up small communities which gradually were assimilated by the rest of the population, though the intruders ultimately had considerable influence on the country's social life.

The first large scale invasion of the island was that led by Julius Caesar in 54 B.C., after a "reconnaissance raid" the preceding

year. He retired without effecting a conquest, being succeeded by Aulus Plautius (A.D. 43). But the Britons were not finally dominated until A.D. 62. (See Britain.) Roman rule was established over the greater part of the country for nearly 400 years. The next and the last successful invasion was by William of Normandy in 1066

(the Conquest). Shortly after the third truce (1377) of the Hundred Years War, the French effected a landing in Sussex, and in 1403 sent out a fleet which sacked Plymouth. In neither case was any attempt made to establish permanent occupation. In 1588 Philip of Spain sent his Armada (*q.v.*) with the object of putting a Spanish army ashore in England, but the fleet was defeated, and no one landed except survivors from galleons wrecked on the English, Scottish, and Irish coasts. During the Napoleonic wars the French assembled a powerful army at Boulogne and concentrated ships for the invasion of England and eventual occupation of London, but only small raids were carried out; at Fishguard, Pembrokeshire, in Feb., 1797, Col. Tate, an Irish-American in the French service, landed with 1,200 men, but was defeated by the local militia.

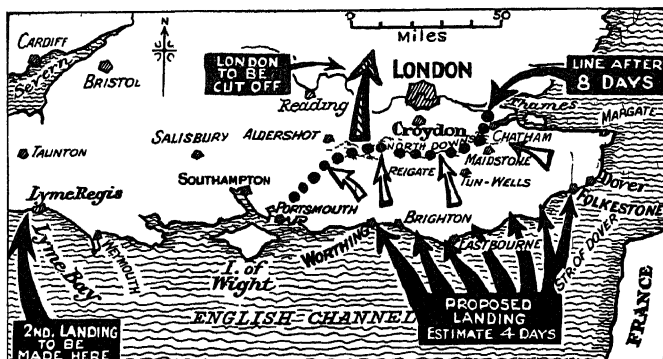
After the defeat of France by Germany in 1940 and the evacuation of the British army from the Continent, the German high command seriously considered putting into operation an organized plan for the invasion of Britain. Known as operation Seelöwe (sea lion), the project was based on a landing

by two armies, totalling 25 divisions, between Folkestone and Worthing. Ten divisions from the French coast were to go ashore on the first four days to form the initial bridgehead, which was to provide the base for an encircling movement designed to isolate London and the south. A second landing was to be made at Lyme Regis with Bristol as its objective and to link with the first invaders N. of London. An air offensive was to have begun on Aug. 13, but the seaborne invasion was not to start until Sept. 15. The date was then postponed until Sept. 21. Thence until the spring of 1942 the Germans fixed four separate dates for invasion, but the defeat of the Luftwaffe, the growing military strength of the U.K., and the unimpairment of British sea power made an attempt impracticable.

For the Allied invasions of the European mainland, 1943-44, see D-day; Italy Campaign. See also North Africa Campaigns.

Invention and Research, BOARD OF. Organization formed in July, 1915, to assist the British Admiralty in stimulating scientific effort in the First Great War. A similar department was later set up by the ministry of Munitions to examine any invention or method likely to be useful. After the armistice in 1918 a commission was appointed to determine what awards and royalties should be paid to inventors. The commission did not complete its work until 1945, and the awards for inventions ranged from £1,000 to £110,000.

During the Second Great War the ministries of Supply and of the three fighting services maintained committees to examine inventions. In 1947 a royal commission began hearing claims for inventions adopted. They totalled £3,000,000 and amongst the first 50 claimants



Invasion. Map showing the German plans for the invasion of Great Britain on the south and south-east coasts, 1940-1942

Courtesy of the Daily Telegraph

were the inventors of the Mulberry harbour, Bailey bridge, plastic armour, sticky bomb, flail tank, and amphibious tank.

Inventory (Lat. *invenire*, to come upon). Term used in English law and business for a detailed list of goods and chattels. Such a list is commonly made out by an executor or administrator, and in some systems of law an executor is bound to make one at the earliest possible moment. An inventory is also attached to a bill of sale to identify the goods and chattels which are mortgaged thereby. See Bill of Sale.

Inveraray. A royal burgh and co. town of Argyllshire, Scotland. It stands on a small bay of Loch Fyne, just where the Aray enters it, and is about 60 m. by bus N.W. of Glasgow. The chief industry is the herring fishery, but the burgh is best known for its connexion with the Campbells. It was founded by a Campbell on the opposite side of the bay and was made a burgh in 1474. The chief buildings are the parish and other churches, the court house, and a reading room. There is an old and beautiful market cross and a memorial to the Campbells who were hanged for their share in the rising of 1685. Dalmally is the nearest rly. station, 16 m. away. Outside the town is Inveraray Castle, seat of the Duke of Argyll; built in the 19th century, it replaced an older structure. It is a quadrangular building with towers at each corner, and stands in an enormous park. Near the town is the curious conical hill of Duniquoich. Pop. 455.

obtained from artesian water pumped to the top of a tower which is both landmark and viewpoint. The public gardens divide the town into N. and S. portions. Government buildings are on a large scale, while there are a town hall and theatre. Bluff is the port, but Invercargill has a second harbour for smaller vessels. It is supported by a rich agricultural and pastoral district and a timber trade. There are rope, twine, and carriage factories, sawmills, brick and pottery works, iron foundries, motor engineering works, and breweries. The neighbourhood affords trout fishing and duck and rabbit shooting. Pop. 27,583.

Inverchapel, ARCHIBALD JOHN KERR CLARK KERR, 1ST BARON. British diplomatist. Entering the diplomatic service in 1906, Kerr served at Berlin, Buenos Aires, Washington, Rome, and Teheran before being appointed minister to the Central American republics in 1925. He was transferred to Chile, 1928; to Sweden, 1931; and was ambassador in Bagdad, 1935-38; in China, 1938-42; and in the U.S.S.R., 1942-46. Then he went to Indonesia as conciliator between the Netherlands government and the Indonesian republican leaders. In 1946 also he was appointed ambassador to the U.S.A. and raised to the peerage; he had



Lord Inverchapel,
British diplomatist

partners retired he became the head of the firm. In addition he developed the steamship service between Glasgow and Ireland. He was created a peer in 1897, and died on Feb. 12, 1901. James Cleland Burns, 3rd baron (1864-1919), was born Feb. 14, 1864, and succeeded to the title in 1905. He was associated with the firm of G. and J. Burns for 34 years, and after the death of his brother was chairman. He was a director of Cunard and deputy-chairman of the Clydesdale Bank. Dying Aug. 16, 1919, he was succeeded by his only son, John Alan Burns, as 4th baron. The latter (b. Dec. 12, 1897) married the actress June, from whom he obtained a divorce in 1933. The family seat is Castle Wemyss, Renfrewshire.

Inveresk. Parish and village of Midlothian, Scotland. It stands on the river Esk, 6½ m. E. of Edinburgh, with a railway station. The parish contains Musselburgh, and the battlefield of Pinkie, 1547, is near. Industries are fishing and net and paper making. There are wire mills. Pop., parish, 20,700.

Inverforth, ANDREW WEIR, 1ST BARON (b. 1865). British merchant. Born at Kirkcaldy, April 24, 1865, he entered a shipping firm in Glasgow. After a time he established the business of Andrew Weir and Co., shipowners and merchants, and made a large fortune. He entered public life in 1917 as surveyor general of supply at the War office, and was minister of munitions, 1919-21. He was raised to the peerage in 1919.

Invergordon. Police burgh and chief seaport of eastern Ross and Cromarty, Scotland. It is on the N. shore of Cromarty Firth, 13 m. N.E. of Dingwall on the railway. It has excellent anchorage facilities and can take ships up to 10,000 tons. Practically free from fog, it is considered suitable as an emergency landing base for flying boats. Since the First Great War it has been a naval base for the Atlantic fleet. In Sept., 1931, when the fleet was assembled here for manoeuvres, some unrest occurred among the ratings as a result of threatened pay cuts arising out of the economic crisis of that year. Although the trouble, which amounted to mutiny on a small scale, was soon settled when the situation was explained by the c.-in-c., the manoeuvres had to be abandoned. Pop. 1,417.

Inverkeithing. A royal and police burgh of Fife, Scotland. It stands on a bay on the N. side of



Inveraray, Argyllshire. An evening study on Loch Fyne with the town reflected in the calm waters

Inverbervie. Name by which the Scottish burgh of Bervie is sometimes known. See Bervie.

Invercargill. A city of New Zealand, chief place in the district of Southland. Situated on the Waihopi estuary, 17 m. by rly. N. of Bluff, it is one of the best laid-out towns in the dominion. The water supply, which with the gas is under the corporation, is

been knighted in 1935. He retired in 1948.

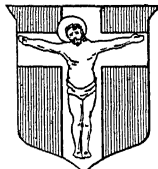
Inverclyde, BARON. A title borne by the family of Burns since 1897. John Burns (1829-1901) was educated at Glasgow university, and became associated with the Cunard Steamship Co., of which his father, David McIver, and Samuel Cunard (q.v.) were the founders. When the original

the Firth of Forth, 13 m. N.W. of Edinburgh. Its church, an old foundation, was rebuilt after a fire in the 19th century. This was a royal burgh in the 12th century. A port, Inverkeithing is in the Rosyth area, and its industries are mainly connected with the navy, but also include shipbreaking, paper making, and stone quarrying. The battle of Inverkeithing, fought about 2 m. from the town, took place on July 20, 1650, Cromwell's troops defeating the Scottish adherents of Charles II. Pop. 3,700. See Rosyth.

Inverlochty. Village of Inverness-shire, Scotland. It stands on the Lochy near where it enters Loch Linnhe, 1 m. N.E. of Fort William. Near the village is a ruined castle. Here, Feb. 2, 1645, the marquess of Montrose defeated the Campbells. He had just ravaged Argyllshire and was returning to Aberdeen, followed by an army under the earl of Argyll. Towards Inverlochty, although he had only 1,800 men, he made a night march through the Grampians and routed his opponents. It is said that the Campbells and their allies had 1,700 slain. The battle is described in The Legend of Montrose.

Invernairn, WILLIAM BEARDMORE, BARON (1856-1936). British merchant. Born at Greenwich, Oct. 16, 1856, and educated at Glasgow high school and Ayr academy, he entered his father's shipbuilding firm of William Beardmore and Co., and became head of it in 1886. Under his management the firm grew in size and importance; during both Great Wars it manufactured all forms of armaments, also ships, aircraft, and tanks. The dirigible R34 was completed by the firm in 1919. Beardmore was knighted in 1914, and in 1921 became Baron Invernairn. He died April 9, 1936.

Inverness. Royal and mun. burgh of Inverness-shire, Scotland. It is also the county town, a seaport, and a market town, and is regarded as the capital of the Highlands. It stands on both banks of the Ness, near where that river enters the Moray Forth,

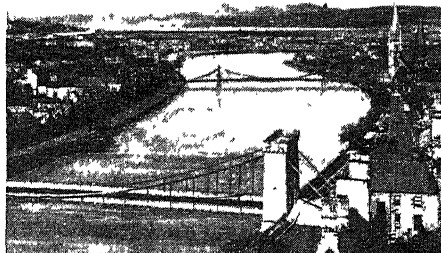
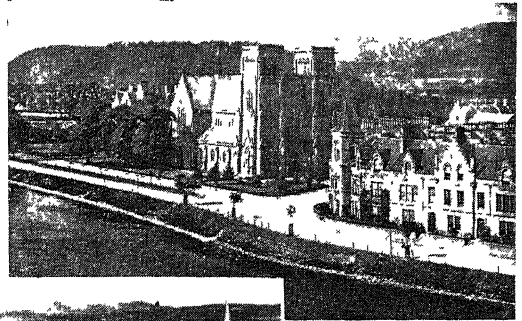


Inverness arms

100 m. W.N.W. of Aberdeen, on two main railway lines, and is near the Caledonian Canal. There is an airport with services to Orkney and Stornoway.

The buildings include the episcopal cathedral of S. Andrew, a

modern edifice, the town hall, several churches, and the 19th century castle on Castle Hill, containing the county offices and court house. The John Forbes memorial fountain and the mercat cross are near the town hall, as is the old stone of the tubs, on which those bringing up water from the Ness used to



Inverness. The town and river Ness; upper picture, the cathedral from Castle Hill

rest their tubs. The cemetery stands on the hill of Tomnahurich and there are several public parks.

Inverness, the headquarters of the old Highland rly., has railway workshops. Other industries are distilling, tanning, and the manufacture of woollens, while welding machines are made. It has a large trade in cattle and agricultural produce generally. A Highland gathering is normally held in August.

Inverness was a Pictish centre and also a place of importance under the early kings of Scotland. This was due to its strategic position, and in the 11th century or thereabouts a castle was built for its defence. It was made a royal burgh in 1180, and the castle was the scene of many stirring events. There was a Dominican abbey here in the Middle Ages. The city was occupied in 1745-46 by Charles Edward and the Jacobites. Market days, Mon., Tues., and Fri. Pop. est. 24,500.

Inverness-shire. The largest county of Scotland. It is bounded N. by Ross and Cromarty and S. by Perthshire and Argyllshire, with the cos. of Nairn, Moray, Banff, and Aberdeen to the E. Its area is 4,211 sq. m. It comprises two portions, the mainland, traversed N.E. to S.W. by Glen More, which contains the Caledonian Canal, and the insular division, which embraces Skye, Harris,

N. and S. Uist, Benbecula, Barra, Raasay, Rum, Eigg, St. Kilda, and a number of smaller islands.

The mainland is highly mountainous and contains Ben Nevis (4,406 ft.), and many other heights above 3,500 ft. The valley and loch scenery is extremely beautiful. Numerous lochs include Ness, Oich, Lochy, Arkaig, and Shiel, while, in addition to Glen More, the prin-

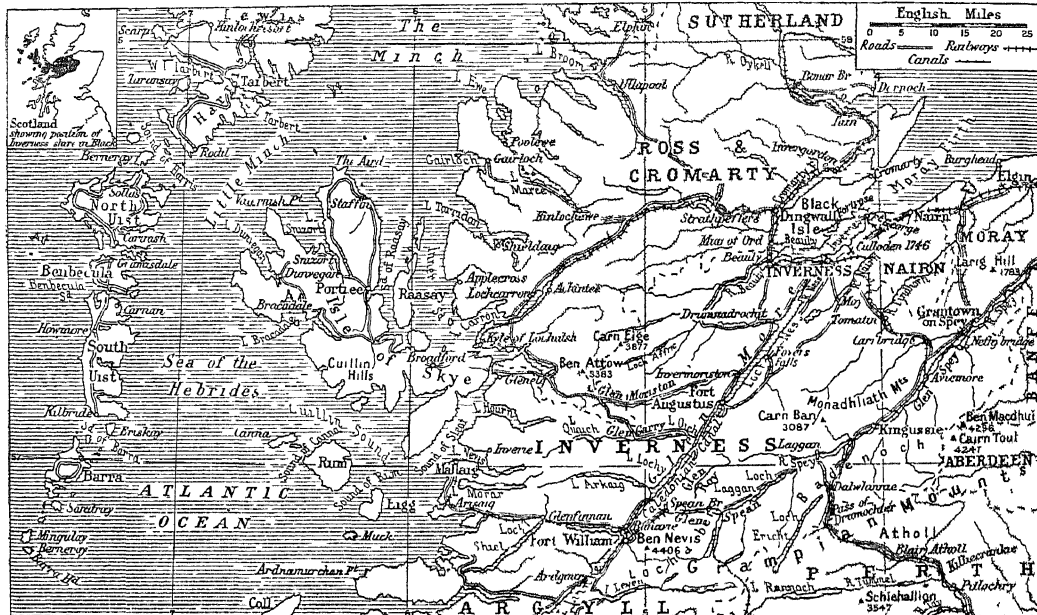
cipal valleys are Glens Garry, Moriston, Spey, Spean, and Roy. The coast is deeply indented by sea-lochs. The chief rivers are the Spey, Ness, and Beaully. Little of the soil is under cultivation, and the land is covered mainly by deer forests and moors abounding in grouse and other game. Sheep breeding is the leading industry, next to which are fisheries and distilling.



Inverness-shire arms

Railways and the Caledonian Canal provide transport facilities for the county. Inverness, the county town, Fort William, and Kingussie are the largest towns. One M.P. is elected, but Ross and Cromarty, and the Western Isles, are also constituencies of the county. Pop. est. 81,300.

LITERARY ASSOCIATIONS. In the literature concerning Scottish history and legend Inverness-shire occupies a considerable place; to the story of the Bruce and to the romance of 1745 it affords background. In Scott's poetry, The Lord of the Isles, and in his prose, The Legend of Montrose (Inverlochty), may be specially noted, while his diary of a yachting tour has much about the island parts of the county. These same islands inspired the famous anony-



Inverness-shire Map of the largest county in Scotland, with its outlying islands. The county is traversed by the Caledonian Canal, which obviates the passage round the North of Scotland

mous Canadian boating song, and much about them and the mainland will be found in Johnson's *Journey to the Western Highlands of Scotland*. Burns's associations are recorded in his lines on the waterfall at Foyers and his song, *The Lovely Lass of Inverness*. At Auchnacarr, Lochiel first displayed the Stuart flag in 1745, and received the warning recorded in Campbell's poem.

Inverse Square Law. General law of physics. It connects the intensity of effect produced at any point with the distance of this point from the centre of influence. For example, the gravitational attraction between two bodies of masses m_1 and m_2 respectively, and distance d apart is proportional to $\frac{m_1 m_2}{d^2}$ i.e. it varies

inversely as the square of the distance. The same law applies to forces between electric charges and magnetic poles; to the intensity of sound waves at a distant point; to the intensity of illumination of a surface, etc.

Inversion (Lat. *invertere*, to turn about). In music, a chord is inverted when its root is no longer the lowest note. The first inversion has its third in the bass; the second has the fifth, etc. Inverted intervals change their character, unless they are perfect intervals, e.g. a major 3rd becoming a minor 9th, and an augmented 4th a diminished 5th.

In mathematics, if from a fixed point O a line is drawn cutting a curve in a point P, and a point P' is determined on OP such that $OP \cdot OP' = a$ constant, the locus of P' is called the inverse of P, and the process inversion.

Meteorologically, an inversion is said to exist when the temperature of the air, which normally becomes less, increases with height. On calm, clear nights inversions often form in the lowest 200–300 ft. of the atmosphere. Fogs on land, especially dense winter ones, usually imply the presence of an inversion. Overhead fogs in which smoke particles are caught up, producing gloomy conditions, are due to inversion layers. At the lower boundary of the stratosphere there is generally a slight inversion before the isothermal region is reached.

In English literature, inversion of the normal order of words to produce an effect is often considered bad style, although examples abound in the *Authorised Version*, e.g. "great was the fall thereof." The device in poetry assists metre and scansion.

Invertase. The name originally applied to the enzyme which catalyses the conversion of cane sugar into a mixture of dextrose and levulose. The name was coined because the mixture formed rotates the plane of polarised light to the left, whereas cane sugar rotates it to the right, the action

of the enzyme thus causing an inversion of direction. The enzyme is now usually called sucrase.

Invertebrate (late Lat. *invertebratus*, unjointed). Name applied to those classes of the animal kingdom which do not possess the characteristic and essential features of vertebrate or chordate animals. The central nervous system is neither dorsal nor tubular; there is no notochord or backbone; there are no gill-slits in any stage; the eye is usually an outgrowth of the skin, and not of the brain; and there is no ventral heart. The principal classes, proceeding downwards, are molluscs, arthropods, echinoderms, worms, coelenterata, sponges, and protozoa. See *Animal*.

Invert Sugar. A variety of sugar which turns a ray of polarised light to the left instead of the right, as does ordinary cane sugar. It is prepared by heating sugar solution with dilute acid or by the action of an enzyme. It is chiefly used in the brewing industry to improve the keeping properties of beer, and to replace part of the malt. See *Sugar*.

Investigator Strait. Channel between Kangaroo Island and Yorke Peninsula, South Australia. It is 25 m. across, and is the outlet of St. Vincent Gulf to the ocean.

Investiture. In feudal custom, the act of installation of a vassal by his superior lord. The investiture was symbolised in early times

by the suzerain handing to the vassal some object, such as a standard or piece of turf. Later the many varying customs became regularised, and the sword and sceptre were generally adopted.

Round the question of investiture was centred one of the great medieval controversies of Church and state. As the holding of lands by the Church all over W. Europe increased, the precise status of ecclesiastical holders in the feudal system became more difficult of definition. Bishops and abbots became not only suzerain themselves, delegating their benefices to lay vassals, but became in turn vassals of the great lay princes. The princes found in this relationship an opportunity to exercise over the ecclesiastical body an influence which the Church could only regard as prejudicial to her own claims of supremacy. Gradually the claim was asserted by the lay princes that by investiture they themselves conferred rights of spiritual as well as temporal jurisdiction, and they took to themselves the absolute right of disposal of abbacies, bishoprics, etc., ignoring the old rights of election. The result was the growth of corruption and simony, which the papacy made several efforts to check, notably by the Lateran decree of 1059, forbidding the clerical acceptance of any office from lay hands.

The Church and the Monarchs

Pope Gregory VII brought the issue to a head, forbidding the emperor Henry IV to grant any ecclesiastical investitures, Feb., 1075. Henry's disobedience brought war, and ultimately his submission at Canossa, Jan. 28, 1077. The principle was confirmed by Urban II in 1090. In England the rights of investiture, contested by Anselm, were finally renounced by Henry I in 1107. The emperor Henry V succeeded his father in 1106, and renewed the old claims. In Feb., 1111, Henry made renunciation of them at Rome, but three days later revoked and arrested Paschal II, who, under duress, temporarily abandoned his position. The Council of Vienne, 1112, declared lay investiture of clerics to be heresy, and other prohibitions were made in 1116 and 1119, but little was effected until the concordat of Worms, signed Sept. 8, 1122. By this the emperor yielded the actual investiture by ring and staff, but retained his feudal rights over the actual ecclesiastical lands, a compromise ratified by Calixtus II. See Acco-

lade; Anselm; Feudalism; Gregory VII; Papacy.

Invincibles. Name given to an Irish secret society which existed about 1880-85. It consisted of the more violent Fenians, and its aims were the murder of persons in authority, landlords, and all upholders of law and order. They were responsible for the Phoenix Park murders (*q.v.*), and for many other crimes and outrages about 1882. See Carey, James; Fenianism.

Invisible Exports, INVISIBLE IMPORTS. Terms denoting the value of commercial services rendered by one country to another. These, though they cannot be seen or expressed in terms of weights and measures, earn a right to payment similar to that resulting from the export and import of visible goods. Thus, in addition to value of the visible goods exported by Great Britain, that country has additional income arising from (a) the freight earned by British ships when carrying foreign cargoes; (b) dividends and interest receivable by British holders of dominion, colonial, and foreign investments; (c) commissions payable by people abroad to British banks, insurance companies, shipping agents, etc.; (d) expenditure in the U.K. by visitors from abroad; (e) royalties on British films shown abroad; (f) royalties from abroad on patents, copyrights, etc., belonging to people in the U.K.; (g) sales of second-hand ships and other goods not cleared through the customs as exports; (h) emigrants' remittances home; (j) expenditure by foreign governments on diplomatic and consular services in the U.K. All such items create indebtedness of other countries to the U.K. as real as the receipt by them of goods. Conversely, U.K. payments of this kind are her invisible imports.

In 1937 the U.K.'s net invisible exports (*i.e.* when the total of her invisible imports had been subtracted from them) were estimated to amount to £330,000,000 (shipping £95,000,000; investments, £195,000,000; commissions, £30,000,000; other, £10,000,000). In 1946 they were estimated at only £120,000,000 (shipping, £10,000,000; investments, £80,000,000; other, £30,000,000).

Invisible Man, THE. Imaginative romance by H. G. Wells, published 1897. The story of a scientist who succeeded in making himself invisible, but was unable to reverse the process, it was made into an American film in 1934.

Invoice (Fr. *envoyer*, to send). Commercial term for the statement sent by a vendor to a buyer with the goods sold to him. It should give full particulars of the quantity and price. When goods are sent abroad it is sometimes necessary to have the invoice signed by the consul of the country to which they are being dispatched, in order to facilitate the payment of the import duties. See Book-keeping.

Involution (Lat. *in*, upon; *volvere*, to roll). In geometry two sets of points are said to be in involution when there is a certain relation or correspondence between them. If a series PP', QQ', RR', etc., are chosen on a line, and O is a point, such that $OP \cdot OP' = OQ \cdot OQ' = OR \cdot OR'$ etc., the points constitute an involution of which O is the centre. See Conic Sections.

Io. In Greek mythology, daughter of Inachus, king of Argos. She was beloved of Zeus, who, to protect her from the jealousy of



Io and Argus, from a fresco in the temple of Augustus, Pompeii

his wife Hera, changed her into a heifer. Hera obtained possession of the heifer, and set the hundred-eyed monster Argus to guard her. Zeus, however, sent Hermes to kill Argus, whereupon Hera sent a gadfly to torment Io. Still in the form of a heifer, she wandered far and wide, and until finally she reached the banks of the Nile, where her prayer to be restored to human form was granted, and she brought forth Epaphus, her son by Zeus. Io is supposed to be the moon wandering in the starry sky represented by the hundred-eyed Argus, while her change into a heifer is a symbol of the crescent moon.

Io. Satellite of Jupiter, nearest of the four discovered by Galileo in 1610. It is 2,400 m. in diameter and revolves at a mean distance

of 262,200 m. from the planet in a period of 1 day, 18 hrs., 27½ mins. Its density (2·7 times that of water) suggests that it is a mass of rock.

Iodic Acid (Gr. *iodēs*, violet-like) (HIO_3). Acid prepared by boiling together one part of iodine with ten parts of concentrated nitric acid. The iodine is dissolved and iodic acid is deposited in crystals. It is also formed when chlorine is passed into water in which powdered iodine is suspended. Iodic acid forms poisonous iodates with alkalis, but potassium iodate occurs as a by-product in potassium iodide.

Iodides. Salts of hydriodic acid. Iodides of most of the elements are known. Metallic iodides are obtained either by direct union of iodine with the metal or metallic oxide, or by dissolving the metal in hydriodic acid. Most are insoluble in water, but lead iodide dissolves in hot water, and when the solution cools is deposited in brilliant yellow scales. The insoluble iodides are mostly of a pronounced colour, e.g. mercuric iodide, a brilliant scarlet, mercurous iodide, green, and silver iodide, lemon-yellow.

Iodide of nitrogen, a dark-brown powder obtained by adding iodine to excess of solution of ammonia, is violently explosive. All iodides are decomposed with the formation of iodine, by chlorine and bromine, and on heating strongly alone or with sulphuric acid. Most are employed in medicine, and silver iodide is used in photography in combination with other silver halides.

The medicinal taking of iodides over too long a period may temporarily cause the condition known as iodism, with sore throat, patchy skin eruption, running nose, inflamed gums, etc.

Iodine. Non-metallic element, belonging to the same group as fluorine, chlorine, and bromine in the periodic table. With chemical symbol I, atomic number 53, and atomic weight 126·92, it was discovered in 1811 by Courtois of Paris during his extraction of sodium carbonate from seaweed ash. A dark, lustrous, crystalline solid which changes to a rich violet vapour on heating, iodine is found widely distributed throughout nature, but only in small quantities and never in the free state. Combined with other elements into simple inorganic salts or complex organic compounds, iodine is present in soils and waters and in all marine and land plants and animals. In higher animals it is

especially concerned with the functions of the thyroid gland.

The chief commercial source is caliche, the crude nitrate-bearing earth occurring in vast deposits in the desert regions of N. Chile. Originally present as calcium iodate, iodine is precipitated in elemental form by sodium bisulphite from the mother liquors from which nitrate of soda has previously been extracted. Seventy-five per cent of the world's annual requirement of about 1,200 tons of iodine is met from this source. The remainder is obtained from seaweed and underground waters of deep oil-well borings and mineral springs in California, Java, Russia, and Italy.

Iodine is used extensively in medicine as an antiseptic and germicide, especially in skin lesions; as a counter-irritant for the relief of pain; as an X-ray contrast medium; as a medication in certain types of goitre; and its action as an "alterative" is used in the treatment of arteriosclerosis and rheumatism in its various manifestations. Among veterinary conditions which respond to iodine therapy are wooden-tongue, joint-ill, fowl paralysis, lung-worm disease, and metritis. Industrial uses are dyestuffs manufacture, photography, electro-technology, heat-sensitive paints, fire prevention, metallurgy, and insecticides.

Iodoform or **TRIIODOMETHANE** (CHI_3). Lemon-yellow solid, with a persistent saffron-like odour. Discovered in 1822 by Sérullas, it is made by heating a mixture of caustic alkali or alkali carbonate and a dilute solution of alcohol or acetone in the presence of iodine.

On a larger scale iodoform is prepared by electrolytic methods from a solution of an alkali iodide in dilute alcohol or acetone, fresh alcohol and iodide being added as fast as the iodoform is deposited. Iodoform, an antiseptic, has been replaced by odourless substitutes.

Iolanthe, OR THE PEER AND THE PERI. Comic opera written by W. S. Gilbert and composed by Arthur Sullivan. It was produced Nov. 25, 1882, at The Savoy, where it ran for 393 performances. An extravaganza in which the fates of fairies, headed by the

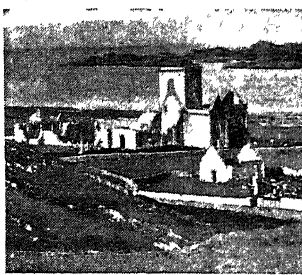
Fairy Queen, are unconsciously linked with those of members of the house of lords, headed by the lord chancellor, the piece finds much of its humour in politics, and Palace Yard, Westminster, is the scene of the second of the two acts. There is sung the sentry's famous song on the theme that "every boy and every gal that's born into this world alive is either a little Liberal or else a little Conservative." Other memorable songs include The House of Peers, A Highly Susceptible Chancellor, The Nightmare, and the mock-magnificent Peers' Chorus.

Iolaus. In Greek mythology, the faithful companion and charioteer of Hercules. He assisted the hero in the slaying of the Lernaean Hydra, and helped his children in their fight for the Peloponnese, killing Eurystheus in battle. According to another legend, he had by this time died, and was permitted by the gods to return from the lower world for the express purpose of assisting the children of Hercules.

Ion. In Greek mythology, legendary founder of the Ionian race. He was the son of Apollo by Creusa, wife of Xuthus. On reaching manhood he narrowly escaped being unwittingly poisoned by his mother. The legend forms the theme of Euripides' play, *Ion*.

Ion. Charged particle which appears during electrolysis. The theory of positive and negative ions is discussed under Ionisation.

Iona. Island of Scotland. One of the Inner Hebrides, it is part of the county of Argyll, lying off the S.W. peninsula of Mull. Its length is about 3½ m. and breadth 1½ m.; it has an area of about 2,200 acres. The village of Iona is on the E. of the island, the W. coast having precipitous cliffs. The few inhabitants



Iona, Scotland. W. front of the restored cathedral, with Celtic cross. Top left, the cathedral from the S.W.

keep sheep and cattle and grow barley, potatoes, and oats, while some are employed in fishing.

Iona, also called Hy, Hii, and Icolmkill, is the Mecca of Scottish Christianity and was previously a Druid centre. Here S. Columba landed from Ireland and founded a monastery, 563, from which monks went out to convert the Picts and Scots. Later a Benedictine monastery and nunnery were founded on the island. On it also is the Reilig Oiran, a cemetery in which lie the remains of Scottish, Irish, and Norwegian kings.

In the 9th century Iona was made a bishopric, which was later in the province of Trondhjem, Norway having at that time rights over the Hebrides. This bishopric became extinct, but about 1507 a new one was created, that of the Isles. The abbey church of S. Mary, a 13th century edifice, was made the cathedral. This was destroyed at the Reformation and the site was long the property of the dukes of Argyll. The 8th duke presented the ruins to the Church of Scotland, and, partly restored, the cathedral was reopened in 1905. There are remains of the nunnery and the chapel of S. Oiran, also crosses, tombs, and other memorials of the past. See Hebrides; consult also *The Story of Iona*, E. C. Trenholme, 1909.

Ionian. Ancient district of Asia, so called from having been colonised by Greeks of the Ionian branch of the Hellenic race. According to tradition, which modern research tends to confirm, the colonists came from Attica about the 11th century B.C.

They settled on a strip of land on the Aegean Sea about 100 m. long, with Lydia as a hinterland, and in the islands of the Cyclades. Their twelve principal cities, Miletus, Myus, Priēnē, Samos, Ephesus, Colophon, Lebedus, Teos, Erythrae, Chios, Clazomenae, and Phocaea, were united in confederacy with the Aeolic city of Smyrna (now Izmir), with a common sanctuary called the Pan-Ionian on Mt. Mycale, opposite Samos. The Ionian cities suffered severely from the Cimmerian invasion about 700 B.C., but maintained their independence against the rising power of Lydia until the time of Croesus (c. 550), when they were forced to submit. With the overthrow of Croesus by the Persians they passed under the dominion of the latter.

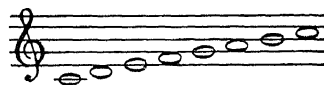
Their revolt about 500 led to the great wars between Persia and Greece, at the end of which in

479 they became allies of Athens. Nearly a century later Ionia again became subject to Persia, until the conquest of the Persian empire by Alexander the Great, and after a period under Macedonian rulers eventually became incorporated in the Roman prov. of Asia. Even under Persian rule the Ionian cities were highly prosperous, and the birthplace of philosophy, science, and history. See Greece.

Ionian Islands. Islands of Greece. Lying in the Ionian Sea, off the W. coast of Greece and S. Albania, they consist of Corfu, Cephalonia, Zante, Leucadia or Santa Maura, and a number of islets, their total area being 752 sq. m. and est. pop. 231,510. Chiefly mountainous, they attain their highest peaks, 5,000 ft., in Cephalonia, but there is good soil which produces grapes, currants, and olives.

Corfu, the ancient Corcyra, with a pop. of 114,620 and area of 227 sq. m., and Cephalonia (pop. 72,140, area 260 sq. m.) are the largest and most populous. Zante has 44,750 inhabitants. The chief towns are Corfu (pop. 32,221), on the E. side of the island of the same name, a port with normally a trade in oranges, wine, and olive oil, and Zante, on the E. of the island of that name, with exports of currants, wine, and olive oil. The islands, among which is Ithaca (*q.v.*), played their part in Greek history. In the Middle Ages they belonged to Venice. In 1814 they passed under British protection, and in 1864 were ceded to Greece. During the First Great War the Allies in 1915-16 occupied Corfu as a place of refuge for the Serbian army after its retreat. For the Second Great War, see under Corfu.

Ionian Mode. In music, a church mode, beginning on C and using only the natural notes, *i.e.* the white keys of the pianoforte. The scale was



with G as its dominant. The Ionian mode therefore corresponded to the modern major scale. See Mode; Scale.

Ionians. One of the three principal branches of the ancient Greek race, speaking a dialect distinct from Aeolic and Doric. Traditionally they were the descendants of Ion (*q.v.*). The name Ionian was applied to the inhabitants of Attica and Euboea, to the

Ionian colonies of Asia Minor, and to offshoots from these.

Ionian Sea. Part of the Mediterranean, the ancient Mare Ionium. Communicating with the Adriatic by the Strait of Otranto and encircling the Ionian Islands, it lies between Greece on the E. and Italy on the W. A notable feature is the long arm, called on the W. the Gulf of Patras and on the E. the Gulf of Corinth, which stretches E. across Greece, separating, but for the narrow isthmus of Corinth, the Morea from the N. and larger portion of the country. By contrast with the shallow Adriatic to the N. the Ionian Sea is deep, forming the N.W. portion of the eastern or Levantine basin of the Mediterranean.

Ionic Order. The second of the three orders in Greek architecture. It is more slender and graceful than the Doric order; the fluting of the column is finer, and its square capital is easily distinguishable from both the Doric and the Corinthian examples by its volutes or spirals. The mouldings of the entablature also are more delicate. See Architecture; Greek Art and Architecture.

Ionisation (Gr. *ion*, going). Process by which atoms or molecules gain or lose electrons and become charged particles. A salt on going into solution partially dissociates into positive and negative ions with the weakening of the electrical binding forces as a result of the high dielectric constant of the solvent. On application of an electric field these ions drift towards the electrodes of opposite sign and become neutralised on reaching them. These facts are demonstrated by Faraday's laws of electrolysis.

A gas under normal conditions is a poor conductor of electricity, but its conductivity may be increased if it is irradiated by X-rays or by ultra-violet, as the neutral atoms or molecules become ionised. By far the most important process for producing ions in a gas is cumulative ionisation, or ionisation by collision, which results from any residual ions in the gas gaining from an applied electric field sufficient energy to disrupt neutral molecules or atoms. These newly-formed ions will move towards the electrodes and in so doing will give rise to further ionisation on collision with the gas molecules. Thermal ionisation is due to the atoms and molecules moving faster with increase of temperature and consequently increasing the violence of their

impact. Photionisation is due to the incidence of photons on other atoms capable of partially or totally absorbing them.

In a given gas the negative ions have a greater mobility than the positive ions. Ions, like dust particles, can precipitate condensation clouds from air super-saturated with vapours.

Ionium. Radio-active element (symbol Io) identical in chemical properties with thorium (*q.v.*).

Ionone (Gr. *ion*, violet). Chemical substance with the characteristic smell of violets, used as the basis of artificial violet perfumes. It is isomeric with irone, the odorous principle of orris-root. Discovered in 1893 and prepared from citral, it has its chief source in lemon-grass oil. The well-known Parma violet perfume is compounded of ionone.

Ionosphere. A layer of the upper atmosphere surrounding the terrestrial globe. Its height above the earth varies slightly, but it begins on the average at 40 miles and has a maximum thickness of approximately 75 miles. The deepest of the various atmospheric layers surrounding the earth, its air is sufficiently rarefied to be ionised or electrified by the ultra-violet radiations of the sun. The ionosphere consists of several strata, in the upper of which the ionising influence is permanent; in the lower strata, that influence is effective only in daytime, is more intense in summer than in winter and in temperate than in tropical climates, and is affected by sunspot activity. These lower strata reflect back to the earth long and medium radio waves and make possible long distance radio transmission over the earth. *See* Fading; Heavyside Layer; Radio.

Iota. Pen-name of Kathleen Mannington Caffyn (*née* Hunt), British novelist. Her reputation as a novelist rests chiefly upon *A Yellow Aster*, 1894, which on its first appearance created great interest on account of its unconventional handling of the marriage question. Iota, being the smallest letter of the Greek alphabet, is used as a term for a small quantity.

I.O.U. Form of written acknowledgement of a debt. The letters are an abbreviation of the phrase *I owe you*. The usual form is "To A. B., I.O.U. £5. C. D., July 19, 1948." Such an acknowledgement of debt does not require a stamp, since it is not a promise or agreement to pay, nor is it a receipt for money. An I.O.U. is not negotiable, but it is evidence

of debt, and as such can be sued upon. If it does not contain the name of the person to whom the debt is owed, then the presumption is that the holder of the I.O.U. is the person to whom the money is payable. *See* Promissory Note.

Iowa. River in the state of the same name in the U.S.A. Rising near the boundary with Minnesota, it flows 329 m. S.E. to join the Mississippi, uniting with the Cedar for the last 28 m. from Columbus Junction. A sluggish stream, moving through bluffs and hills, it is not an artery of trade, and by Act of Congress in 1870 was declared unnavigable above Wapello.

Iowa. North-central state of the U.S.A. The Mississippi forms its entire E. border, while the Missouri flows along three-quarters of the W. border. The state of Missouri lies S. and Minnesota N. Bluffs along the chief rivers are the only relief to an undulating land surface of 55,986 sq. m. This is the leading agricultural state of the Union. It has 97 p.c. of its land under cultivation, including 25 p.c. of the nation's Grade A agricultural land; supports 36 p.c. of its pop. on farms; and provides more than a tenth of all food produced in the U.S.A., ranking first for maize, oats, hogs, poultry, market cattle, and horses. Other crops are buckwheat, barley, flax seed, soy beans, sweet potatoes, potatoes, hay, apples, pears, and grapes. Iowa is the world's greatest producer of popcorn and timothy seed.

There are no big industrial centres, the varied manufactures being dispersed throughout the state, which has the world's largest cereal, washing machine, and fountain pen factories. It makes agricultural implements, rly. equipment, motor car bodies, furnaces, gas and electrical equipment, bronze, aluminium, and copper goods, clothing, pearl buttons, and cosmetics. Mineral resources include 3,000,000 tons of coal a year, gypsum, limestone, clay, sand, and gravel.

Besides natural water transport, there are 8,884 m. of rly. and 83 airports. No farm or town is more than 10 m. from a rly. station. Education is provided by 25 universities and colleges, and Iowa has the nation's highest literacy rate, 99.2 p.c. Two senators and eight representatives go to congress. Des Moines is the capital. Iowa became a territory in 1838 and a state on Dec. 28, 1946. Pop. 2,538,268. *Pron.* with accent on first syllable.

Iowa City. Co. seat of Johnson co., Iowa, U.S.A. The city stands on the Iowa, 55 m. W.N.W. of Davenport, and is served by rlys. and an airport on the trans-continental air mail route. The surrounding country is agricultural. Here are the state university, with its medical centre, and more than 50 buildings, dominated by the Old Capitol, now a centre of administration. Founded in 1839, Iowa City was incorporated in 1853 and was the territorial and later the state capital until superseded by Des Moines in 1857. Iron ore was an important product before the Civil War, but it became exhausted, and the superior deposits of Michigan and the rise of Pittsburgh led to the furnaces being closed. Products today are coke, steel, stoves and ranges, Portland cement, bricks and tiles, and chemicals. Textile machinery is made and maize is processed. Pop. 17,182.

Ipecacuanha (*Uragoga ipecacuanha*). A Brazilian plant, the dried roots of which are used in



Ipecacuanha. Foliage and flower of this Brazilian medicinal herb

medicine. The most important constituent is an alkaloid called emetine (*q.v.*). Ipecacuanha forms a useful emetic, particularly for children suffering from bronchitis or laryngitis associated with difficulty in breathing. The drug has a stimulating effect upon the mucous membrane of the lungs, producing coughing, which renders it of value in bronchitis or phthisis accompanied by difficulty in expectoration. Ipecacuanha or emetine may be used in cases of amoebic dysentery. The chief preparations are the liquid extract; the tincture; and the compound pill with squill. This herb is also a constituent of *Dover's powder*.

IpHicles or **IPHICLUS**. In Greek mythology, son of Amphitryon and Alcmenē, and half-brother of Hercules. He became the faithful companion of the hero.

Iphicrates (d. 353 B.C.). Athenian general. The son of a shoemaker, he rose rapidly in the Athenian army, and at the age of 25 was in command of a force sent to help the Boeotians. His victories over the Spartans and others were largely due to his formation of a new class of fighter (*peltastai*), midway between heavy and light armed troops. During the Social war he was prosecuted for cowardice, having declined a naval engagement with the enemy in a storm, but was acquitted. *Pron.* I-fik-rat-eez.

Iphigenia (Gr. *Iphigeneia*). In Greek legend, the daughter of Agamemnon and Clytemnestra. When the Greek fleet destined for Troy was detained at Aulis by a calm sent by Artemis, who had been offended because Agamemnon had killed a stag sacred to her, Calchas, the soothsayer, declared that Agamemnon must sacrifice his daughter to appease the wrath of the goddess. Iphigenia was sent for, under the pretext that she was to be married to Achilles; but at the moment when the sacrifice was about to take place, Artemis bore her off in a cloud to the country of the Tauri, where she became a priestess. There subsequently came her brother Orestes and his friend Pylades, and as strangers they narrowly escaped being sacri-

Great War, it was occupied by Japanese forces after the British withdrawal, Dec. 29, 1941, and liberated by the surrender of the local Japanese in Sept., 1945. It has rly. connexion with Penang and Singapore.

Ipoly. Tributary of the Danube, also known as the Eipel or Ipel. It rises in the Ore Mts. of Slovakia, and flows at first due S., then S.W., and then again S. to join the Danube near Szob, E. of Esztergom in Hungary. Length 120 m.



Ipomoea. A genus of plants belonging to the Convolvulaceae. See Jalap; Morning Glory.

Ipsophone. Device for taking telephone messages in the absence of a recipient, recording them automatically and repeating them when required. Every incoming call is recorded on a magnetised metal tape similar to that used in the Blattnerphone (*q.v.*) and stored until required. To prevent unauthorised persons receiving messages, the Ipsophone is fitted with a set of numerals which can be made up into a combination known only to the authorised user. To receive a recorded message, the receiver is lifted, the combination set, and an electronic relay then causes the steel tape to pass through an apparatus which converts the electric impulses into speech.

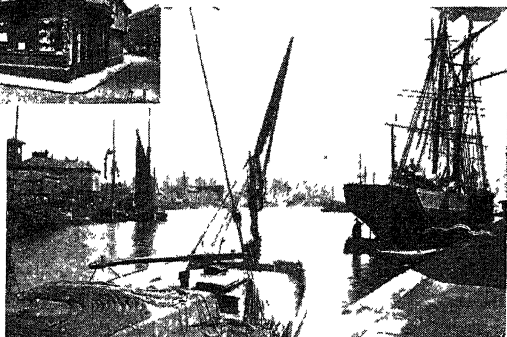
Ipswich. A city, county, and mun. borough of Suffolk, also a seaport and the county town. It stands where the Gipping becomes the Orwell, 69 m. N.E. of London, and is a railway junction. Of its old churches the chief are S. Margaret's, S. Lawrence's, S. Matthew's, and S. Peter's with its Norman font.



Ipswich arms

Modern ones include S. Michael's, All Saints', S. Thomas's, All Hallows', and the Roman Catholic S. Pancras's. S. Mary-at-Tower has been rebuilt, but has interesting antiquities. There is a fine modern town hall; near it, on Cornhill, is the corn exchange. There are museums, an art gallery, public libraries, and hospitals.

Ipswich school, founded in the 15th century, is in a modern building; there are technical, art, and other schools. Wolsey's Gateway, built by the cardinal, is a reminder of the great college he planned and began here, and the city has several old houses and streets. The former include Sparrow's House (1567) and Pykenham Gateway. There are several places



Ipswich, Suffolk. The docks on the Orwell. Upper picture, Sparrow's House, built 1567, in the Buttermarket Frith

of amusement; also Christchurch and other public parks. The Great White Horse Hotel figures in The Pickwick Papers as the scene of Mr. Pickwick's misadventure in a lady's bedroom.

Ipswich is a centre for engineering works. Agricultural implements and rly. wagons are made. Other industries are tobacco manufacture and the making of clothing and boots and shoes. There is a port with docks of 30 acres, and vessels up to 5,000 tons come to berth. Local govt. is by a mayor and corporation, which provides water and electricity, and owns the markets. Ipswich is a borough constituency. With Bury St. Edmunds it is the see of a bishop.

The original name of Ipswich was Gipeswic. It was a town at the time of Domesday, and its burgesses received many privileges from the kings. It sent two members to parliament in 1295 and retained the right until 1918. A prosperous port in the Middle Ages and later, it was in the 15th century a centre of the wool trade. A cemetery of the period 450-600



Iphigenia awaiting her sacrifice at Aulis

From a mural painting in Pompeii

ficed, Iphigenia recognizing her brother. The story of Iphigenia is the subject of two plays by Euripides, one by Racine, and one by Goethe. *Pron.* I-phij-eni-a.

Ipol. Town of Perak, Malaya. The centre of the Malayan tin mining industry before the Second

was discovered here in 1906, and from it were taken necklaces, drinking cups, etc., now in the museum. During both Great Wars there were several raids by German aircraft. Pop. est. 100,000.

Ipswich. City of Queensland, Australia. Standing on the Bremer river, 24 m. by rly. S.W. of Brisbane, it has rly. works and coal mines in the vicinity, manufactures woollen goods, and has a trade in agricultural produce. Pop. 25,703.

Iqbal, SIR MUHAMMAD (1876-1938). An Islamic poet. Born at Lahore, he was educated there and at Cambridge university, and was appointed professor of philosophy at Government College, Lahore. A passionate love of all things Islamic permeated his life and work, and he took a prominent part in the political life of the Punjab. He was knighted in 1923 for services to Indian literature. Outstanding among his collections of essays and poetry were *Secrets of the Self*, 1915; *The Mysteries of Selflessness*, 1916; *The Message of the East*, 1923; *The Call To March* (Urdu poems), 1925; *Songs of a Modern David* (in Persian), 1930.

Iquique. A seaport of Chile, capital of the dept of Tarapacá. On the coast, 40 m. by rly. W.S.W. of Tarapacá, and 150 m. S. of Arica, it is the chief nitrate port of Chile, and is almost surrounded by an arid desert. Its water supply comes by an aqueduct from the Cordillera at Pica. There are rly. shops, soap and boot factories, and a water distilling plant. The anchorage is sheltered, but vessels have to load from launches owing to heavy surf. The city is the outlet for the famous mines of the interior, which are linked up by rly.

The silver mines of Huantajaya lie to the N. of the city. The chief exports besides nitrates are iodine, copper ore, and borax. In 1868 and 1877 the city suffered much from earthquakes. A naval action was fought off the coast in 1879, and the city, formerly belonging to Peru, was finally handed over to Chile in 1883. During the revolution of 1891 it was captured and held for a time by rebels. Pop. 39,282. *Pron.* Ee-kee-kay.

IQUITOS. Tribe of American Indians. They are found in Ecuador, about the headwaters of the Amazon, although now few in number. They are specially known for their skill in making the drink called chicha. *Pron.* Ee-kee-tose.

IQUITOS. Town and river port of Peru, capital of the dept. of Loreto. It stands on the Marañon

or Upper Amazon, 348 ft. above the level of the sea, 58 m. above the mouth of the Napo and 210 m. W. of Loreto. Founded in 1863 to open up trade with the Atlantic coast by means of the river, it carries on an extensive trade in rubber and Panama hats, and possesses a shipyard, floating dock, government ironworks, machine shops, and lumber mills. Ocean-going steamers ply up the river as far as the town, 2,500 miles from the open ocean. A highway connects it with Lima. Pop. 40,000.

Irala, DOMINGO MARTINEZ DE (1486-1557). A Spanish explorer. Born in the prov. of Guipuzcoa, he went to S. America with the early adventurers, helped to discover the countries watered by the river Plate, and was in 1538 chosen captain-general of this region. He died in Paraguay.

Iran. Official name for Persia. Generally it is the old name of the great plateau of Central Asia and the tribes inhabiting it. Iran was the land lying between the Caucasus, the Hindu Kush, the Indus, the Persian Gulf, Kurdistan, and the Tigris, thus including Afghanistan and Baluchistan. Historically, ethnographically, and linguistically, Iran is of the

greatest interest as a cradle of the human race. *See* Persia.

Iranian. Branch of the Aryan sub-family of Indo-European languages, the other branch being the Indo-Aryan. The word, ultimately identical with Aryan, designates also the tableland (Iran) between the Tigris and Indus. Iranian includes Zend, the language of the Avesta, and Old Persian. This passed through Middle Persian (Pahlavi) into New Persian. Allied therewith are the dialects of the Baluchi, Kurds, and Ossetes, and Pushtu. The term does not indicate race. Iranian-speaking peoples embrace the long-headed Persian and Pathan, and the round-headed Tajik, everywhere with ethnic admixture. Originally herdsmen, they absorbed Aryan agriculture and religion, long since overlaid by Mahomedanism. *See* Aryan; Indo-European; Pathan.

Irapuato. Town of Mexico, in the state of Guanajuato. It is 32 m. S. by W. of Guanajuato and is served by the National rlys. of Mexico. It contains a number of old convents, and is known as the Strawberry City on account of the great quantity and fine quality of the fruit, which is the chief article of trade. Drawn thread work is a notable craft. Pop. 21,500.

IRAQ: ARAB STATE OF ASIA

Here is the description and history of the state of Iraq, formed in 1919 from the ancient Mesopotamia (q.v.). See also the articles on Euphrates and Tigris; Bagdad, Basra, Mosul, and other towns; Arab League; Berlin-Bagdad Railway; Mesopotamia, Conquest of; also Feisal I, Feisal II, Rashid Ali el Galaini, etc.

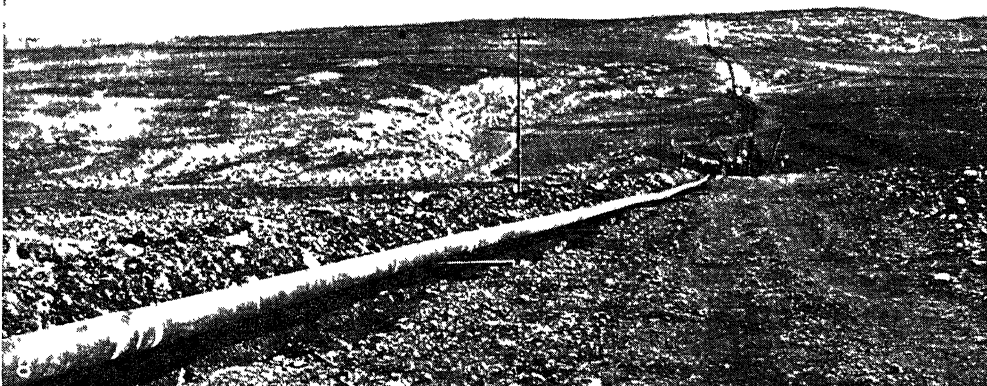
Iraq is an independent state of Asia, the ancient Mesopotamia. It consists of the three former vilayets of the Ottoman empire, Bagdad, Basra, and Mosul. Its area is 116,600 sq. m. and its population 4,611,350.

It is bounded by the Persian Hills on the E., the mountains which run through Asia Minor eastwards on the N., the Syrian mountains on the W., and the northern deserts of Arabia on the S. It may be divided into three E.-W. belts: (1) the northern, or mountainous, from the headwaters of the Euphrates and Tigris to the foothills about Birejik and Jezirah; (2) the central, or undulating, from (1) to the latitude of Tuz Khurmatli, virtually the N. limit of the date palm, with a rainfall sufficient for crops; (3) the southern, or alluvial proper, S. of (2), chiefly saline lands (often containing 15 p.c. lime), usually desert, but very fertile near water. This is the date-growing district. The largest towns are Bagdad,

the capital (pop. 1,009,098), Mosul (553,488), Basra (400,078), and Diwaniya (334,909). Basra, on the tidal river, the Shatt-el-Arab, is the only port. The bar at the mouth is a hindrance to deep-sea-going vessels.

The climate is good for eight months of the year. The summer is very hot, the temp. reaching 124° F. at Bagdad, and 115° F. at Mosul. May to Sept. are the worst months. The heat is never unendurable in the towns, but Basra is trying to Europeans. The season for rain begins in Nov. and ceases about April; snow has occurred as far S. as Babylon. The average rainfall is about 8 ins. p.a. The country, particularly in the N., is healthy.

The geology of the N. belt shows sedimentaries (limestone, etc.) with small granitic tracts in the N.W. and two large volcanic tracts between the two rivers extending intermittently from the N. of Diarbekir (in Turkey) as far S. as Mosul. In the central



1. Young Arab woman of Bagdad. 2. Elderly Kurd from the Mosul region. 3. Octogenarian Jew. 4. Arab herdsman from the west bank of the Tigris. 5. Melons being ferried across the Tigris in goofahs. 6. Excava-

tions at Eridu (*g v*), which have disclosed a prehistoric temple beneath the later ziggurat. 7. Arab beehive village. 8. Oil pipe-line, seen (during construction), running from Kirkuk to Palestine and Syria

IRAQ: CONTRASTS OF OLD AND NEW IN THE MESOPOTAMIA OF THE BIBLE

Photos, 1-5, 7, E.N.A. 6, Directorate of Antiquities, Bagdad, 8, Topical

belt the limestones and chalky deposits of the foothills give place to red-brown lands, marls, gypsums, etc., on the flatter parts, relieved by a marble outcrop near Mosul, and the super-cretaceous red sandstone range of the Jebel Hamrin N. of Bagdad. In the S. belt the delta is alluvial clay with rare outcrops of limestone. At the volcanic cone Jebel Senam there are quarries. Granite lies along the Persian frontier in a long belt, behind the nearer limestone slopes. A poor coal is found near Kifri; petroleum and naphtha in the Kirkuk district and at Qaiyara, N. of Qal a Sherqat; petroleum is also brought by pipeline from an oilfield near the Persian frontier to Khanaqin, 30 m. N., to be refined; bitumen is found at Hit.

On the Euphrates and Tigris and their affluents depends the immense fertility of the land, which, according to Herodotus, returned seed two hundredfold. The cultivable area in the delta is 10,000,000 to 12,000,000 acres.

The winter crops are wheat, barley and beans; the summer

crops maize, millet, rice, sesame, melons, and cotton. Tobacco is grown, and about 80 p.c. of the world output of dates. Grapes, pomegranates, oranges, lemons, figs, apricots, mulberries, and walnuts are the chief fruits; vegetables are plentiful, except the potato, for which the egg-plant is a substitute. Lucerne grows in the date plantations, and liquorice grows wild near water, and is exported to America. Wool is another important export. Building timber in the central and southern districts is scarce. In S. Iraq the reed thickets provide the material for the construction of Arab huts.

Wild and Domestic Animals

Domestic animals are the horse, introduced after 2000 B.C., ass, ox, buffalo, humped ox in the S., sheep, goat, and dog, including the saluki, a hunting dog, and in the flat districts, camel. Wild animals are a kind of panther, jackal, hyaena, fox, gazelle, pig, and, in the hills, ibex; smaller are the desert hare, jerboa, and, in the S., mongoose, and there are tortoises and crabs in the rivers.

Anciently there were elephant, lion, and onager. Birds include the eagle, vulture, buzzard, kite, raven, hawk, owl, many kinds of water-fowl, stork, ibis, kingfisher, etc., and sea-fowl.

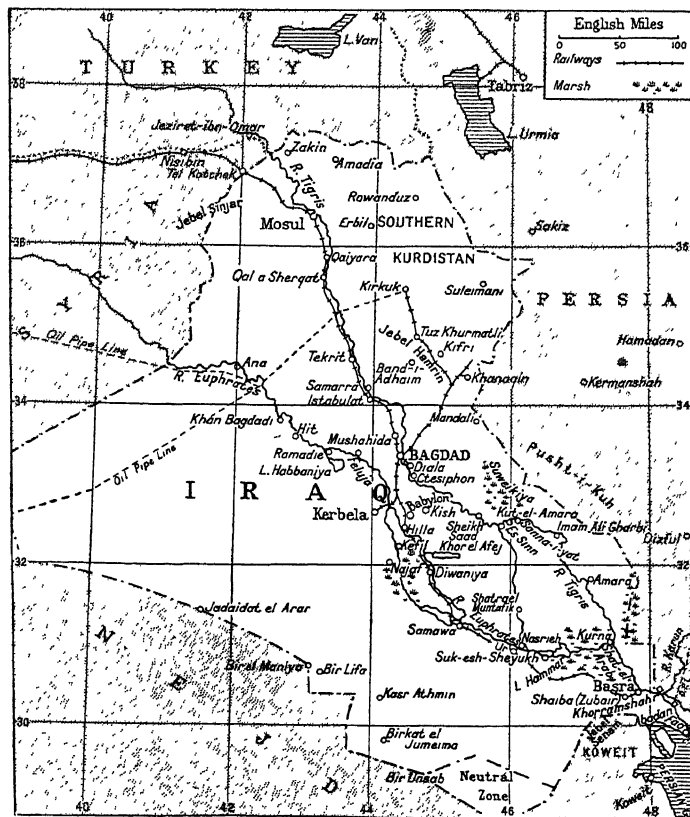
Arabs form 94 p.c. of the pop., with various minorities, Kurds, Jews, Turks, in that order. There are 3,136,632 Mahomedans; 101,375 Christians; 90,970 Jews; and 41,134 of other religious beliefs (Mandaeans, Yazidis, Bahais, etc.). Christians, chiefly of Armenian and old Nestorian stock, live about Mosul and in Bagdad. The Arabs, broadly speaking, consist of (1) *fellahin*, or settled cultivators; (2) nomads who move from one grazing ground to another. The three largest tribes are the Shammar, the Anazeh, and the Muntafik. The Chaldean community numbers only about 70,000, but among its members are men of letters, doctors, and lawyers, and it possesses schools, societies, and many convents. The 25,000 Syrian Catholics possess a splendid monastery which dates from the 4th century A.D. The Orthodox Syrian community, about 12,000 in number, is descended from the great Semitic family which adopted the Christian faith at the dawn of Christianity and had a flourishing civilization that endured for many centuries. Their head is the 120th patriarch of Antioch and the East.

Education and Health

Primary education, from 6 to 12, is free and, in theory, compulsory; secondary education, from 13 to 20, is also free. Arabic is the medium of instruction except in the Kurdish speaking areas, where Kurdish is used. In 1945-46, 76,960 boys and 24,017 girls were attending 902 state elementary schools, 8,848 boys and 2,461 girls were attending 71 intermediate and secondary schools. Iraq has no university, though there are colleges for medicine, pharmacy, training of teachers, law (all co-educational), engineering and military training (both for boys).

Malaria, directly or indirectly, accounts for some 50,000 deaths a year; it is due chiefly to the imperfect system of agricultural irrigation which makes control of the malaria transmitting mosquito very difficult. Hookworm affects probably a third of the pop.

Wheel-turned pottery, plain or with a blue glaze, copper vessels, baskets, cloth, dyeing materials, tent-cloths from hair, especially gypsum mortar, Arab summer cloaks, woollen rugs and coarse



Iraq. Map of this Arab-populated state through which flow the Tigris and Euphrates, showing the railways.

carpets, clothing, matches, cigarettes, cement, tiles, and alcoholic spirits are made.

There are about 1,000 m. of state-owned rlys. The chief line runs from Basra to Bagdad, 354 m., passing the ancient cities of Ur, Babylon, and Kish. At Bagdad, a ferry across the Tigris continues the line to Kirkuk, 201 m. to the N.; a bridge was under construction in 1950. Branches run from Jouloula to Khanaqin, and from Bagdad through Mosul to Tel Kotchek. The last part of the long-planned Berlin-Bagdad rly., connecting Bagdad with the Bosphorus, was completed after the outbreak of the Second Great War, and inaugurated July 17, 1940. There are 4,000 m. of roads suitable for vehicular traffic; only 1,200 m. are, however, metalled.

Iraq is a limited monarchy. The king is advised by a cabinet, responsible to a parliament (*majlis*) of two houses.

HISTORY. Conquered from the Turks during the First Great War, Iraq was in 1919 declared a mandatory state, and the mandate for it was given to Great Britain. In 1921 Feisal (1883-1933), a son of the king of the Hejaz, was elected king by the votes of the people, and in 1922 relations between Iraq and Great Britain were defined by a treaty, under which Great Britain was to recommend Iraq for membership of the League of Nations at the earliest possible moment. This she did in 1932, when the League terminated the mandate, Great Britain and Iraq having entered in 1930 into a treaty of alliance.

Death of King Feisal

Up to the end of the mandate the leaders of Iraq, guided by British advisers, initiated changes that promised progress. Feisal showed himself capable both of controlling the city politicians and of acting as a link between the tribes and the town populations. His sudden death, attributable in the main to overwork, was a disaster for the country. His son, King Ghazi, lacked qualities of leadership, and the result was a struggle for political power between various personalities who made use of local conditions. Under the Organic Law of 1924, on which the constitution is based, the king had no right to dismiss a cabinet (an amendment of 1944 gave him this power). Attempts were made to change the government by tribal uprisings, but the premier Yasin al-Hashimi used the armed forces of the state to

put these down. A series of *coups d'état* engineered with the help of the army followed, both before and after the accession of four-year-old Feisal II, in 1939. The most serious was that of 1941, when a former prime minister, Rashid Ali el Galaini, a man with pro-Axis sympathies, deposed the regent, Ameer Abdul Illah, uncle of the king, on April 11. On the 18th, British troops arrived by sea at Basra, to Rashid's surprise. They were given permission to land, on condition that no more should be landed until those already ashore had crossed the frontier out of Iraq.

Attack on R.A.F. Camp

A few days later Iraqi troops began to concentrate round the R.A.F. camp at Habbaniyah, near Bagdad (maintained like the R.A.F. camp at Shaibah, near Basra, under the 1930 treaty). They shelled it May 2-5, while their air force bombed and machine-gunned it. German aircraft appeared in their support, May 12, Italian on May 29. But British troops were advancing on Bagdad, Rashid fled, and the Iraqis asked for an armistice signed May 31. British troops occupied Mosul on June 3. The Regent returned to Bagdad, and Iraqi affairs became more placid. Iraq declared war on Germany, Italy, and Japan, Jan., 1943, but did not take an active part in the struggle. Iraqi sympathies were with the Arabs over the Palestine question, and the premier, Nuri Fasha, toured the Arab states in 1944 and helped to form the Arab League.

British forces were withdrawn in 1947, except from the R.A.F. bases at Habbaniyah and Shaibah. A military treaty with Gt. Britain, signed at Portsmouth, Jan. 15, 1948, was repudiated by a new Iraqi govt., Feb. 4.

Bibliography. By Tigris and Euphrates, E. S. Stevens, 1921; Amurath to Amurath, G. Bell, 1929; Iraq from Mandate to Independence, E. Main, 1935; The Making of Modern Iraq, H. T. Foster, 1936; Iraq, a Study in Political Development, P. W. Ireland, 1937; Twin Rivers, S. Lloyd, 1946.

Irawadi or **IRRAWADDY** (anc. Erivati—the great river). River of S.E. Asia. It rises in two head-streams on the S. slopes of the Nam-Kiu mts. bordering China. The branches unite about 30 m. N. of Myitkyina, and the river, henceforth known as the Irawadi, traverses Burma from N. to S. and discharges into the Bay of Bengal

by a delta of several mouths, W. of Rangoon. The delta has an area of 20,000 sq. m., and between the Bassein and Rangoon channels is a network of waterways with jungle swamps and teak forests, and paddy fields in the clearings. N. of Promé, almost to Mandalay, the lower valley is without rly. communication. Above Mandalay three rlys. use the valleys of tributaries rather than that of the main stream. The longest tributary is the Chindwin, which flows through the almost inaccessible and mountainous parts of N.W. Burma. N. and E. of the Irawadi the country is hilly and thickly covered with forest as far as the borders of Assam and Bengal on the W. and the frontiers of China and Siam on the N. and E.

The river attracts the population and commerce of Central and Upper Burma, leaving a fringe of semi-civilized tribes on each side. About 900 m. in length, it is of great importance for irrigation and as a trade channel. It is navigable for over 800 m. for passenger and goods steamers, and Bhamo can be reached by smaller craft. Above this town the river is obstructed by rapids. Mandalay is the chief town on the river, but Rangoon stands on the Rangoon branch of the delta.

Japanese Invasion

Japanese forces which invaded Burma from Siam reached the Irawadi early in March, 1942, British troops evacuating Rangoon March 7 and withdrawing N. The Japanese entered Mandalay on May 1. The Allied Ledo road forces cleared the upper reaches of the river during 1944. Farther S. the 19th Indian div. (British 14th army) crossed it at Singu on the night of Jan. 14-15, 1945; and when, at the beginning of March, the Japanese concentrated their forces to protect Mandalay against a threatened attack from the W., advanced rapidly S. down the E. bank of the Irawadi, securing full control of Mandalay by March 20. Rangoon was occupied by sea and airborne troops on May 3, and the whole course of the river was freed when forces advancing from N. and from S. met at Tharawaddy on May 16.

Irbit. Town of Asiatic Russia, in the Sverdlovsk region of the R.S.F.S.R. It is 100 m. N.E. of Sverdlovsk on a branch rly., at the junction of the rivers Irbit and Nitza. The great fur fair in Feb.-March dates from 1643 and was the first to be reopened after the civil war, in 1922. Pop. 11,719.

IRELAND: THE ISLAND AND ITS HISTORY

EDMUND CURTIS, M.A., former Prof. of Modern History, Dublin, J. E. MILES, and others

This article is concerned with the whole of Ireland as a physiographical entity, also with the history of its people and its government from earliest times down to 1922, the year of its partition into two states. For later history, together with details of political administration, education, industry, trade, etc., see the separate articles on Eire and Northern Ireland

Ireland is the second largest island of the British archipelago, and is separated from Great Britain by the Irish Sea and the North and St. George's Channels. Its area is 32,586 sq. miles. It is surrounded by shallow seas, being well within the continental shelf. The middle of the island, between Galway and Dublin Bays, is a lowland drained by the Middle Shannon, the Liffey, and the Boyne. The rock is entirely carboniferous limestone.

N. of this central plain older rocks trend from S.W. to N.E., falling into line with corresponding rocks in Scotland. The plateau of Antrim, the Sperrin Mts., E. of the Foyle, the mts. of Donegal in the N.W., the mts. of Mayo and Connemara comprise igneous rocks or crystalline schists similar to the Scottish highlands. The lower hills which stretch from Longford to the N.E. belong to the Silurian system and are continued in the S. uplands of Scotland; the igneous Mourne Mountains lie within the Silurian area.

The lower ground of the Upper Shannon and the Erne is a continuation of the limestone plain, with outcrops of millstone grit in the Erne watershed. The limestone extends to the S. in the upper valleys of the Barrow, Suir, and Blackwater. The S.E. or Wicklow Highlands form the highest part of a series of Cambrian and Silurian rocks which stretch N.E. from the W. side of Waterford Harbour. On both sides of the Shannon estuary and on the hills near Kilkenny on both sides of the Nore, millstone grit and the coal measures control the relief of the land.

Results of Glacial Action

The highlands of the S., the Galtee and Knockmealdown Mts., and the mts. of Kerry, including Macgillcuddy's Reeks, trend E. and W. in roughly parallel ridges and consist mainly of Devonian old red sandstone; like the heights of Cornwall, Devon, and S. Wales, they are relics of an old system of folded mountains. The rocks are older than the coal measures except in the two areas noted, so that there are no extensive coal-fields in the island. Fjords such as Killary Harbour and Carlingford Lough, many lakes such as those

of Connemara, the erratics of the Mourne and Wicklow Mts., and the eskers or ridges of glacial gravel of the Central Plain are all relics of glacial action. Dingle, Bantry, and other bays of the S.W. coast are not fjords but rias, or drowned valleys between hill ridges; their formation owes nothing to glaciers.

The central limestone plain has gentle slopes and is the source of much peat; the bog of Allen lies between the Shannon and the Liffey. Some of the lakes which are characteristic of the lowland are due to river expansion in shallow troughs, e.g. Lough Derg; others, like the Erne lakes, are caused by the solution of the limestone in the river water. Lough Neagh occupies a fault in the volcanic plateau.

Outlying Islands

The principal islands are off the N. and W. coasts. Rathlin Island is in the N. channel off Fair Head; Tory Island and Aran Island off Donegal; Achill Island off co. Mayo; and the Aran Islands lie in Galway Bay. The southernmost point of Ireland is Cape Clear, on Clear Island, co. Cork.

Ireland has more rain than England by approximately 10 ins. per annum; the S.W. highlands are wettest, and in general the W. is wetter than the E. Spring is the driest and autumn the most rainy season. The heavy rains give to the island its noted greenness of landscape. The highest areas are moorland, but elsewhere the expanses of pasture land are broken by clumps of woodland.

The rains supply water for the lakes and bogs, many of which fill old lake beds, and for the numerous rivers. The Shannon, with its tributaries, drains quite half of the central plain; the Suir flows through the Golden Vale of Tipperary, but its valley, like those of the Barrow, Nore, and Slaney in the S.E., is circumscribed by hills. The parallel valleys of the Blackwater, Lee, and Bandon, falling into line with the ria-estuaries of the S.W., are due to the parallel ridges of the sandstone mts. The Boyne is the great river of the eastern plain.

Ireland has few minerals; coal is worked in Kilkenny (Castle Comer) and Tyrone, rocksalt is obtained in Antrim (Carrickfergus);

peat is the common source of fuel, and can be used to make paper, tar, and manures. The people depend almost entirely upon agriculture. Three-quarters of the area is cultivated, almost two-thirds of this being under grass. Arable accounts for nearly a third of the farmed area; the chief crop is oats, which is most extensively grown in the N.E., where flax is almost equally important. Although potato culture has declined, about one-tenth of the arable is still devoted to this crop; hay is grown upon nearly half the arable land. Dairying, largely for butter, and the attendant pig-rearing on the by-products of the dairy, and horse-breeding are great industries based upon the high proportion of pasture. The sea fisheries fluctuate in value. Mackerel abound off the W. coast, herring off the W. and S. and in the Irish Sea.

There are over 3,000 m. of railways, 672 of them in N. Ireland. Of the 650 m. of inland navigable waterways, most are in Eire; they include the Grand Canal (opened 1765; total length 208 m.), the Royal Canal (opened 1818; 96 m.), and the Shannon navigation.

Political Divisions

Politically, Ireland has been divided since 1922 into two states, Eire (known until 1937 as the Irish Free State) and Northern Ireland. It is also divided into four historic provinces; of these Munster, Leinster, and Connacht are in Eire, while the province of Ulster, except for the counties of Cavan, Donegal, and Monaghan, forms Northern Ireland. Of the 32 counties, 26 are in Eire and six in Northern Ireland (see table in next page).

HISTORY. The Neolithic and Bronze age inhabitants of Ireland were of the long-headed or Mediterranean race. They are remembered in native tradition as the Fir Bolg and were probably the Picts. The Bronze age metal-workers had to import Cornish tin but copper was abundant, and the discovery of the rich gold deposits of Wicklow made Ireland a focus of western European trade. Magnificent gold ornaments of the period prove the wealth of the country and the skill of its crafts-

men. In the 4th cent. B.C. a tall, blond Aryan race, who called themselves *Gaedhil*, entered Ireland; few in number, but superior by virtue of their iron weapons to the bronze-using aborigines, these Gaels conquered the whole island and imposed upon it their Celtic speech.

The earliest epics tell of a kingdom in Ulster ruled by Concobar about the time of Christ. Later a Connacht dynasty conquered the rich province of Meath and founded a line of kings whose title was *Ard Ri* (High King). One of these, Cormac mac Airt (c. A.D. 250), led expeditions which plundered Roman Britain, and stored the booty in the great forest-camp of Tara. He established the national Feis, or assembly of Tara, and is said to have organized the native law (*Dlígh Féine*, or the *Brehon* code). Under his descendant Niall of the Nine Hostages (379-405) this Connacht-Meath dynasty not only commanded the homage of all Ireland, but the Irish, known to the Romans as *Scots*, made settlements in Britain. In 500 Fergus mac Earc, a chief from Antrim, crossed to Scotland and founded the kingdom of *Dalriada* in what is now Argyllshire.

There were at this time in Ireland seven kingdoms, three in Ulster, Leinster, Munster, Connacht, and Meath, the two latter held by the *Ard Ri*, who was supreme over all Ireland. One family, the *Ui Néill* (descendants of Niall), held this title 400-1022.

Religion of Ancient Ireland

The pagan Irish religion was a Druidism brought from the Continent. They worshipped the elements, believed in supernatural beings called *sídh*, and had gods such as the *Dagda*, *Lugh Lamhfhada*, etc. In some districts idols such as *Crom Cruach* were adored, the royal burial place on the Boyne (*Brugh na Bóinne*) was especially sacred, and the other world *Magh Mell* (Plain of Honey) was an unfading Paradise to which even the living could pass. The High King had priestly functions, and his chief Druid was the head of a great corporation of *Fili* (*Filé* meaning poet, sage, and priest).

This worship did not long survive the mission of Patrick (432-461), who from Armagh converted most of the country. His mission had decisive results; he is said to have reviewed and humanised the laws, and Ireland was henceforth opened up to the learning and civilization of Latin Europe. The *Fili* after a struggle accepted the new faith, but survived as lay

REPUBLIC OF EIRE

LEINSTER		
County	Acres	Population
Carlow ..	221,485 ..	33,862
Dublin Co. ..	227,724 ..	618,997
Kildare ..	418,644 ..	64,559
Kilkenny ..	509,470 ..	68,006
Leix ..	424,892 ..	49,260
Longford ..	257,935 ..	37,107
Louth ..	202,814 ..	65,108
Meath ..	577,824 ..	65,298
Offaly ..	493,636 ..	52,029
Westmeath ..	435,605 ..	55,133
Wexford ..	581,061 ..	45,980
Wicklow ..	500,250 ..	58,295
MUNSTER		
Clare ..	787,756 ..	86,192
Cork Co. ..	1,845,593 ..	346,548
Kerry ..	1,161,705 ..	136,072
Limerick Co. ..	665,971 ..	142,211
Tipperary ..	1,051,292 ..	136,939
Waterford Co. ..	454,278 ..	75,968
ULSTER (part)		
Cavan ..	467,172 ..	71,660
Donegal ..	1,193,581 ..	138,035
Monaghan ..	318,985 ..	57,959
CONNACHT		
Galway ..	1,467,660 ..	166,231
Leitrim ..	376,764 ..	46,219
Mayo ..	1,333,941 ..	150,985
Roscommon ..	608,540 ..	74,062
Sligo ..	443,917 ..	62,842
COUNTY BOROUGHES		
Dublin ..	18,740 ..	495,074
Cork ..	2,685 ..	75,484
Limerick ..	2,386 ..	42,070
Waterford ..	1,438 ..	27,825

NORTHERN IRELAND

Antrim ..	702,900 ..	197,266
Armagh ..	312,767 ..	108,815
Down ..	609,057 ..	210,687
Fermanagh ..	417,912 ..	54,569
Londonderry ..	512,580 ..	94,923
Tyrone ..	779,548 ..	127,586
COUNTY BOROUGHES		
Belfast ..	15,289 ..	438,086
Londonderry ..	2,198 ..	47,813

literati, cultivating literature in the Gaelic language. The formerly pagan and warlike Irish soon developed an amazing enthusiasm for missionary work and education.

Of her most famous missionaries S. Columba (Colmcille) converted Scotland; from his foundation, Iona, Irish monks christianised Northern England. On the Continent Columbanus, who evangelised Switzerland, was the first of a long line of Irish missionaries of whom a chronicler said "their habit of wandering has become almost second nature." John Scotus (d. 874) was for original speculation the glory of Charles the Bald's court. At home the numerous Irish schools attracted swarms of both native and foreign scholars, and the wonderful Book of Kells (9th century) remains in art the most admirable product of this civilization. Politically the *Ui Néill* maintained the *Ard Ri*-ship, though after the conversion to Christianity Tara was abandoned.

The Viking invasion, beginning about 800, shook Ireland to its base. Olaf the White (c. 850) founded a Norse kingdom about Dublin.

Later, others of these pirates occupied Waterford, Limerick, Wexford, and Cork, and, though their raids at first were ruinous to Irish civilization, the Norse, who became Christian about 1000, by founding towns and by their trading enterprise became a valuable element in the country. Munster especially had suffered from the ravages of the Danes, who plundered the monasteries and destroyed "the countless books of the Gael" carrying off their silver cases.

At last Brian Ború (of the Tributes), a prince of the ruling race of Tuadh-Mumhain (N Munster), in the middle of the 10th century broke the Danish yoke. His ambition led him to usurp the kingdom of Munster, and when in 1000 he overthrew the Leinstermen and the Dublin Danes at Glenmama, he became king of the southern half of Ireland. The hereditary *Ard Ri*, Maelsechlainn, had to yield to him, and Brian became High King. He justified his career by giving Ireland the strongest monarchy she had known. Under his patronage learning and religion rapidly revived.

Advance in Civilization

In 1004 Brian laid a present of gold on the altar at Armagh, and his scribe recorded the gift in the presence of Brian, *Imperator Scotorum*, i.e. High King of both Ireland and Scotland. But the king was slain at Clontarf in 1014, where the Irish gained a great national victory over a Norse army of invasion, led by Sigurd, earl of Orkney. The throne was contested between the O'Briens, O'Connors, and O'Neills. At last Turloch O'Connor of Connacht (1118-56) became *Ard Ri*, and was succeeded by his son Ruairi.

If politically there was little progress, in other directions Ireland was advancing. The exquisite Cormac's Chapel still to be seen at Cashel, built by a Munster king (1130), the stately High Crosses, the great book collections of history and epic such as the Book of Leinster, all witness to the quickening civilization of native Ireland. A great attempt to reform the Church and bring it into closer touch with Rome was made under S. Maelmaedog (Malachy), archbishop of Armagh, and at the Synod of Kells (1152) the full diocesan system was adopted, and four archbishops, Armagh, Cashel, Dublin, and Tuam, were created. The native law, written down in such books as the *Senchus Mór*, divided Ireland into *tuaths*, or "hundreds," a number of *tuaths* formed a *Mór Tuath* a number of these again

formed a Fifth (*coigeadh*), and the five Fifths, Leinster, Munster, Connacht, Ulster, and Meath, were subject to one Ard Ri.

The king, whether the Ard Ri or the provincial king, was elective out of the royal stock, dwelling in a *dun* (earthen fort). He had a *demesne* for his support, and tributes of food and military service from his vassals. Some clans were free; others were tributary, so in land tenure, there were free tenants (*saorcheile*) and some bond (*daorcheile*), like the freeholders and villeins of a Norman manor. In law, the chief feature was that of money compensation (*eric*) for offences. The Brehon or judge acted as arbitrator and received part of the fine imposed.

Coming of the English

In 1154 the English pope Adrian IV granted Henry II permission to enter Ireland and reform faith and morals. Giraldus Cambrensis declares that an actual Bull, *Laudabiliter*, granted Ireland to the English king, but probably little would have come of this had not Diarmuid MacMurchadha, king of Leinster, driven out by the High King, sought Henry's aid, and obtained permission to recruit in Wales, 1167. The landing of a few Norman Welsh adventurers, among whom the Fitzgeralds were especially prominent, followed by Richard Strongbow, earl of Pembroke, 1170, was fatal to the old Irish monarchy. Diarmuid gave his daughter to Strongbow, and promised him the kingdom of Leinster. The high king, indeed, marched with all the national forces to Dublin and besieged the invaders there, but Norman resource and courage prevailed. Henry, fearing that Strongbow would found a separate kingdom, hurried over, and received at Dublin the homage of the chief Irish kings.

Their acceptance of Henry as a suzerain could not save the Irish princes. The crown made vast land grants in defiance of their rights, and Hugh de Lacy, earl of Meath, and de Courcy, earl of Ulster, proved themselves great conquerors. In 1185 Prince John arrived with the title "Lord of Ireland" (*Domnus Hiberniae*) by papal grant, and further land grants alienated the native chiefs. When John came over as king, 1210, he established counties, set up a royal administration in Dublin presided over by a justiciar or viceroy, and granted English laws to the colonists. Unhappily the Irish were not granted legal equality with the English. The English colony flourished for a century, and Munster, Leinster, and Meath were thickly

planted. Numerous towns arose, trade developed, and Anglo-Norman institutions took deep root. But the king was an absentee, the justiciars were seldom men of ability, and the powers of the nobles were fatal to the central power.

The rights of the Irish were little regarded, thus in 1223 all Connacht was granted to Richard de Burgo, though the rights of the O'Connors to it had been recognized. The conquest, however, remained incomplete and the Normans failed to unite Ireland, as they had done England. Few of the first families lasted for long. Leinster fell into five liberties on the extinction of Strongbow's heirs, the Marshalls, 1245, the de Lacys died out, and Ulster and Connacht were united under the de Burgos. In the S the Fitzgeralds of Kildare and Desmond and the Butlers of Ormonde took the first place.

Edward I's great viceroy, Sir John Wogan, imitating his master's policy in England, summoned an Irish parliament, 1297, which was completed in 1310 by borough members, but it was a purely colonial assembly, and the native race were unrepresented. The defeat of Edward II at Bannockburn seemed a great opportunity to the aggrieved Irish to right their wrongs, and their remonstrance, sent to the pope by Donal O'Neill, declared they had offered the throne of Ireland to Edward, brother of the King of Scots. Arriving with a great army, 1315, and crowned king of Ireland at Dundalk, Edward Bruce swept through the midlands again and again, but he was defeated and slain at Fochart by a colonial army, 1318. English rule was thus restored. But the native chiefs had won many local triumphs, adopting heavy armour and cavalry, and building strong castles, they steadily recovered their lost ground.

Anglo-Irish Nobles

To replenish the depleted ranks of the nobles after the Bruce war, John and Maurice Fitzgerald and James Butler were created earls of Kildare, Desmond, and Ormonde respectively, but in 1332 the last de Burgo earl was murdered, and most of Ulster fell to the O'Neills. The viceroys of Edward III obeyed his orders to reduce the power of the Anglo-Irish nobles, but in vain, for these had become a "middle nation" friendly to the Irish, and hostile to the rule of English officials. Finally Lionel of Clarence, the king's son, earl of Ulster in right of his wife, de Burgo's heiress, was sent as viceroy, 1361-67, but could not even prevent two male de Burgos from usurping his lord

ship of Connacht, and founding there the two families of Clanricarde and Burke of Mayo.

A solution of the race feud was attempted by the statutes of Kilkenny, 1366, where parliament limited the area of English speech and law to the Eastern counties, ordered the Irish within this "pale" to become English, and treated the Irish outside it as enemies, incapable of trading or marrying with the colonists, or pleading at law. In spite of this the outlying English continued to become more and more identified in speech and customs with the Gaels.

Condition under Richard II

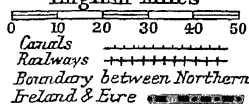
In 1394 Richard II came over to restore the colony, bring back the "border English" to English law and allegiance, and subdue the Irish, who had now a great leader in Leinster, Art MacMurchadha. Richard won over the four native kings and seventy chiefs to swear homage, at Dublin and Drogheda, but after his departure his cousin and heir, Mortimer, was slain in battle by the Irish, 1398, and Richard again came over to avenge him. He was at once recalled, however, by the news of Bolingbroke's landing in England.

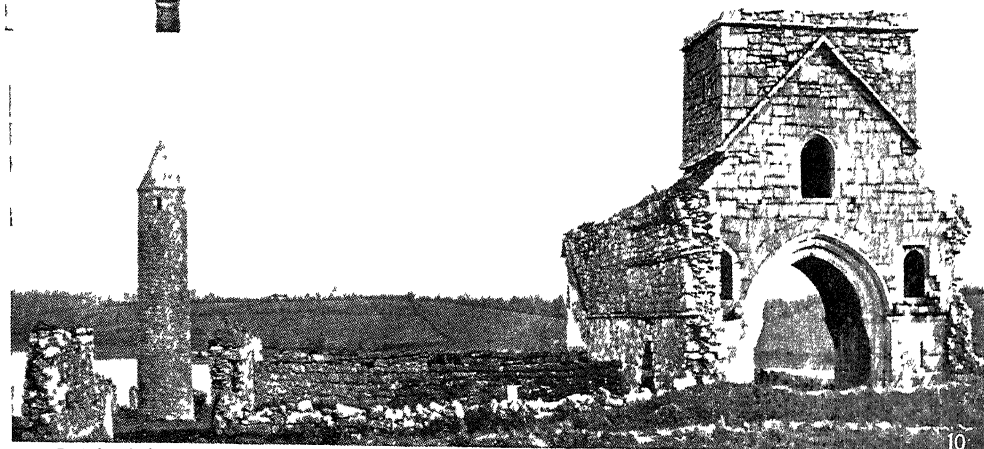
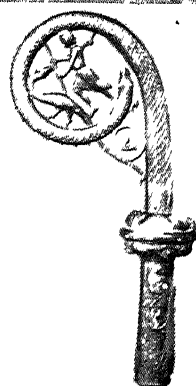
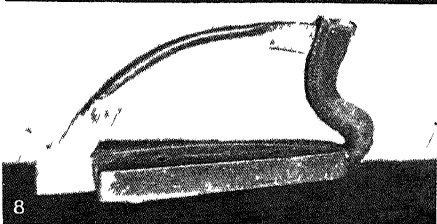
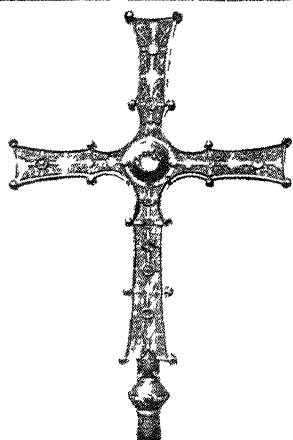
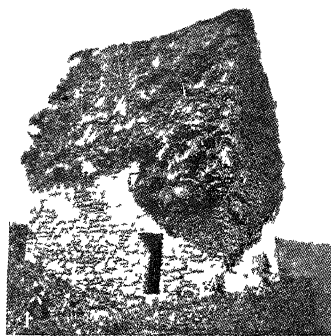
Under the Lancastrians, the ruin of the colony steadily proceeded. The area where English law and speech still obtained was limited to the towns, S Wexford, and the counties Dublin, Meath, Louth, and Kildare. Among the Irish there was a great revival of scholarship and culture, marked by the compiling of great books of epic and history, such as the Book of Ballymote, a culture which most of the colonists readily embraced.

Irritated by the rule of English-born officials, a native party formed among the Anglo-Irish, led by the earl of Ormonde, and when in 1459 Richard, duke of York, came over as viceroy, but actually a refugee, this patriot party, among whom he was popular as the heir of the Mortimers, seized the opportunity to declare the independence of the Irish parliament. Thus a period of Home Rule began, which lasted till 1534, in which Ireland was virtually independent, the earls of Kildare being almost hereditary deputies. The English hold on Ireland was only saved by the fact that no real union of Anglo-Irish and Gaels was possible.

The fall of the House of York created dismay in Ireland, where most of the country was for them, and Lambert Simnel, whom the native party regarded as true heir, was crowned king in Christchurch, 1487. Warbeck also received the support of Ireland, but these

English Miles





1 S. Columba's house at Kells 2. Ancient cromlech near Newcastle, Down 3 One of the Ogham stones, showing the notched inscription. 4. Circular stone fort near Derry 5 Fireplace in the ruined castle of Donegal, 17th century 6 The Cross of Cong, executed

in 1123, now in the Science and Art Museum, Dublin 7 Cinerary urns from tombs, with typical Celtic designs. 8 Old Irish harp 9. Ancient crozier. 10 Remains of the monastic house of S. Molaise on Devenish, Lough Erne, with round tower, 85 ft. high

IRELAND: ANTIQUITIES OF CHRISTIAN AND PRE-CHRISTIAN TIMES

attempts to found a separate Irish state failed. In 1494, Henry VII's deputy, Sir Edward Poynings, induced the Irish parliament at Drogheda to agree that henceforth proposed laws must receive the sanction of the king and English privy council. On the other hand, only the Irish parliament was to be competent henceforth to pass laws binding Ireland internally.

Policy of Henry VIII

Henry VIII's rejection of the papal supremacy caused the first serious breach between the two countries. Kildare being detained in England, his son, "Silken Thomas," rose, fearing that the family power was in danger, and proclaimed himself of "the Pope's Sect," but his overthrow and execution with five uncles, 1535, showed that the crown was determined to be supreme in Ireland. Henry, however, showed the qualities of a statesman, rejected his council's proposals of a new conquest and plantation, made the Gaelic chiefs for the first time barons of the crown (thus O'Neill became earl of Tyrone), and got the Irish parliament to accept him as king of Ireland, the papal title of Dominus being rejected, 1541. The weak points of Henry's policy were the enforcing of the Reformation, the confiscation of the abbey lands, and the edicts against Irish customs and language.

Under the Catholic Mary the policy of confiscation was adopted, and Leix and Offaly (King's and Queen's counties) were planted with English. Under Elizabeth a series of risings showed that almost the whole nation was now alienated from the crown. The Irish chiefs had been made by Henry absolute owners of their territories, but Brehon law regarded them merely as elective heads of the clan, with a demesne and tributes from their vassals. The religious difference grew stronger, the Old English nobles resented the governing of Ireland by English officials, and the towns and the English of the Pale were united with the Old Irish on the question of religion. The clear policy of the crown to extend English law over the island alarmed the whole nobility. Shane O'Neill rose in defence of the Celtic order, 1560-67, and made himself almost king of Ulster, but was defeated and slain.

The excommunication of Elizabeth by Papal Bull, 1570, made the religious tension worse; the mass of the Irish definitely took the papal side, the Old English could not be counted on, and the discontented looked to Spain. The greatest of the Norman nobles, the

earl of Desmond, alarmed at the plans for the planting of Munster, 1579, rebelled; but in 1583 was hunted down and killed. Munster, which had been terribly wasted, was by the second great act of confiscation planted with English. Connacht, however, was pacified by Perrot's Composition of 1585, by which the landowners were secured in their estates.

Hugh O'Neill, nephew of Shane, had been made earl of Tyrone, and, renouncing the name O'Neill, seemed an enemy of Celtic ideas; but alarmed at the danger to his powers in Ulster by the extension of English law, he united with the young Hugh O'Donnell, and began the Nine Years' War (1592-1601). Taking the name "the O'Neill," the greatest native name in Ireland, and backed by most of the clans and many of the Old English, his military and organizing skill made him almost king of Ireland. At the battle of the Yellow Ford, 1598, he cut to pieces an English army of 4,000, but without artillery, and none of the towns openly joining him, his only hope was Spanish aid. When a Spanish fleet and army arrived at Kinsale, Sept., 1601, there seemed a prospect of an Ireland totally freed from England, but the Irish army was routed, the Spaniards surrendered, and finally O'Neill surrendered in 1603.

Plantation of Ulster

The accession of James I opened a new era. The Celtic law was abolished; the people of Ireland, Irish and English, were brought under the common law; and Catholic and Protestant met in one parliament. Catholics were indeed excluded from office, otherwise religious persecution was not severe. But the confiscation of six counties after the flight of O'Neill and the earl of Tyrconnell, after a suspected plot, and the plantation of Ulster, 1607, with English and Scots against all the rights of the Irish, made that province a danger point, and plantations in Leinster further alarmed the Catholics.

In Charles I's reign the earl of Strafford, as deputy, 1632-40, showed what a stern personal government could achieve. Filled with the idea of making Ireland an aid to the crown against the Puritans, he relaxed the penal laws against Catholics, fostered industries such as the linen trade, and made Ireland a prosperous state. When the open struggle between king and parliament began, the inevitable rising in Ulster of the dispossessed Irish took place; the rest of the island took arms in dread of a Puritan conquest; and a remarkable leader, Rory O'More,

succeeded in uniting the country on the policy of securing religious toleration and the independence of parliament.

To maintain the Catholic confederation which at Kilkenny acted as a native government, Owen Rua O'Neill, nephew of Hugh, arrived from Spanish service in Flanders, showed great qualities, and overthrew a Scottish Puritan army at Benburb, 1646. The king's lieutenant, Ormonde, strove to unite Ireland for the crown, but union was difficult when the Old Irish aimed at virtual independence.

Cromwell's Conquest

Finally the re-conquest was begun by Cromwell, who landed on Aug. 1, 1649. The Ulster army, whose chief, Owen Rua, died Nov., 1649, made a gallant stand till 1652, but by then the war was over, and Cromwell's lieutenants completed the conquest. The Cromwellian settlement has left the bitterest memories. In order to secure a Puritan-English ascendancy the Catholic landowners were removed to Connacht, and the Catholic population crushed.

The Restoration did little to heal these wounds, for, by the Act of Settlement, Cromwell's settlers kept their lands, and 1660 marks the date when the Catholic landowners became a minority, and the culture and language of the Gaelic population fell into rapid decay. The English parliament, representing the commercial jealousies of England, began a new era of injustice, 1667, by forbidding Ireland to export her cattle to England. Still, Irish prosperity rapidly revived, and as long as the Stuarts ruled, the crown protected Ireland from the ill-will of parliament and prevented the full operation of the penal laws.

On the accession of James II and under the lord-lieutenant Tyrconnell (1687-91), the Irish Catholics hoped to reverse the Act of Settlement, repeal Poynings' Act, and secure free trade and religious liberty. In March, 1689, James landed as a refugee from England, but William III's campaign, beginning at the Boyne, and ending with the siege of Limerick, 1691, ended the struggle. The treaty of Limerick, by which the Catholics were guaranteed their estates and a considerable measure of religious liberty, was not observed; further confiscations took place, only 1,000,000 acres being left in the hands of the Catholic freeholders; and Ireland, no longer protected by the Stuart monarchs, was subjected to the enmity of the English parliament. Thus, in 1698, the latter forbade

the import of Irish wool, and in union with the now purely Protestant parliament of Ireland put into effect a whole body of persecuting statutes, the "Penal Laws."

The Catholics were excluded from parliament and the franchise, were denied education, and forbidden to acquire land, with many other shameful disabilities. Most of their leaders emigrated to France, the mass of the people under the new landlords sank into mere tenants at will, under the worst land laws in Western Europe. The history of Ireland for a century was that of the Anglican ascendancy, the Presbyterians being almost as much outside the law as the Catholics themselves. But the Acts in restraint of Irish trade and the subjection of their parliament by the Declaratory Act, 1719, by which the English parliament affirmed its right to legislate for Ireland, soon turned this ascendancy into a patriot one.

Molyneux began a movement which finally found a great leader in Henry Grattan. After securing to Ireland most of the benefits won by England at the revolution, and passing some measures of relief to Roman Catholics, the patriot party determined first to secure free trade and then legislative independence. The backing of volunteers, raised to defend Ireland during the American War, enabled Grattan to demand and secure from England practical free trade, and, by the repeal of Poyning's Law and the Act of 1719, legislative independence.

The Act of Union

During the period of Grattan's parliament, the prosperity of Ireland advanced in a remarkable degree, and in 1793 the Roman Catholics were admitted to Trinity College and to the electoral franchise. However, the English-appointed ministry was not responsible to parliament; the House of Commons, like the English, was corrupt and unrepresentative; and reformers such as Flood, who aimed at a wider suffrage, could not carry their measures. The Roman Catholics and Presbyterians of Ulster were still subject to religious disabilities, and nothing was done to relieve the peasants from the cruel land laws. Consequently republican ideas spread as a result of the American and French Revolutions. The disunion of Ireland increased. The Orange Society, which arose among the Episcopalians of the North in 1793, preached a bitter hostility to the claims of the Roman Catholics for full civil rights. The United Irishmen aimed at first merely at the reform of

parliament, but turned its hopes to an Irish Republic under the protection of France.

An inevitable rising took place in 1798. Most of the leaders were taken; Tone died in prison, and, after a Presbyterian rising in the North and another in Wexford, and a French landing in Mayo, the rebellion ended in failure. Pitt had earlier been a friend of Ireland, but he was impressed with the bitterness of party strife there and with the danger to England of an almost independent Irish parliament.

A union, therefore, was determined upon; and though the patriots and even the Orange lodges fought hard against it, a corrupt and unrepresentative majority accepted the bribes by which the union was carried, 1800. A promise thrown out to the Catholics implied that the emancipation which the Irish parliament would not concede would accompany the union, but Pitt failed to secure the assent of George III to this. By the Act of Union the separate kingdom of Ireland ceased to exist. Ireland was given 100 members in the House of Commons, and 34 in the House of Lords; full free trade was established; and for twenty years Ireland was to contribute to the expenses of the United Kingdom in a proportion of 2 to 15.

O'Connell and Emancipation

From this time the Protestant aristocracy ceased to lead the country, and the Protestant population generally became reconciled to the union. But the refusal of emancipation rankled with the Catholics, who found a great leader in O'Connell. His programme was a double one: emancipation, and repeal of the union, which by exposing Irish goods to the competition of England's great industries, made free trade of little advantage. The Established Church, with its tithes, formed a further grievance, and though under the corn laws agriculture prospered, the peasantry under bad land laws, and rapidly increasing, were in a wretched state. O'Connell, backed by the Catholic association, secured election at Clare in 1828, and in 1829 Wellington gave way, and the Emancipation Act liberated both Catholics and Dissenters.

The Whigs coming in after 1832 set themselves to make concessions to Ireland, and under Drummond, chief secretary, 1835-40, the tithe question was settled by the Commutation Act, the poor law was established, and the Municipal Corporation Act reformed the boroughs. O'Connell still strove for repeal, but his dislike of violence

weakened his position, and the "Young Ireland" party led by Davis and Mitchel, in their paper *The Nation*, preached the more popular doctrine of revolution. In 1843 government forbade the monster meeting fixed by O'Connell at Clontarf.

The disaster of the Great Famine overshadowed all other questions. The failure of the potato crop in three seasons (1845-47) left the poorer peasantry without food, and the government failed to cope with the situation. From 1845-51 the population, 8,500,000, fell by 1,500,000 through famine and disease; a great tide of emigration set in to the U.S.A.; the Irish language and ancient traditions began rapidly to disappear; and the seeds of the land war were laid owing to the ruin of great numbers of the old landlords and the transfer of estates by the Encumbered Estates Act, 1849, to new speculating owners. Stung by the horrors of the time, and in accord with the revolutionary wave then sweeping Europe, Smith O'Brien and Mitchel attempted an armed rising, but it was a pitiful failure.

For many years Ireland displayed little life, and all the time free trade in corn, adopted by Peel in 1846, was ruining Ireland's main industry. In 1850 a Tenant Right League advocated the extension of the old Ulster custom (by which the tenant had an interest in his holding, and could sell it on leaving) over all Ireland. A further attempt at armed revolt was made by the Fenians, whose movement beginning in 1859 subsided in 1868.

Gladstone's Home Rule Bills

Gladstone's Land Act of 1870 extended the Ulster custom over Ireland and offered facilities for purchase by tenants. In the same year the Home Rule Association was formed to win for Ireland control over internal affairs. Butt was its leader; from 1871 Parnell led an uncompromising left wing, and on Butt's death in 1879 his striking personality was supreme. By the forming of the Land League, 1879, mainly Davitt's work, the land agitation was linked to the cause of self-government. The harvests were bad, and there was great discontent. Still Parnell in the main persuaded the Irish race at home and elsewhere to abandon Fenianism and trust to parliamentary agitation together with a vigorous war on landlords. The Land Act of 1881 conceded fixity of tenure, fair rents, and free sale. Finally Gladstone, converted to the Irish view of the case, brought in the Home Rule Bill of 1886, which was promptly thrown out by the Lords.

The Conservatives coming in adopted the policy of "killing Home Rule with kindness."

The O'Shea divorce case ruined Parnell, and after a gallant fight to recover his position, the "uncrowned king" died suddenly on Oct. 6, 1891. A. J. Balfour, when he was chief secretary, carried through a land act which allotted £30,000,000 for land purchase, and under his regime a number of light rlys. helped to open up some of the poorer districts. Taking office again in 1892, Gladstone made a further attempt to carry Home Rule, but there was a revolt in the Liberal ranks: the house of lords rejected the bill, and the Irish party, hopelessly split by Parnell's fall, went into the wilderness.

Beginning of Sinn Féin

The mind of Ireland was no longer concentrated on purely political questions. The Gaelic League, founded 1893, launched a movement, which has grown steadily from that time, for the revival of the dying Irish language. Sinn Féin (ourselves alone), a doctrine fathered by Arthur Griffith and John MacNeill, taught the up-building of Ireland by Irishmen on their own soil, but though it declared that the Irish members should abandon Westminster and return home, it still gave the party, now under John Redmond, a chance to win Home Rule.

On the part of Britain there was a series of concessions, such as the County Councils Bill of 1898, setting up local self-government; a Land Act in 1896, and a further one in 1903 (Wyndham's Act), by which finally the Irish peasantry became owners of the soil. In 1906 the Liberal party, then triumphant at the polls, offered an instalment of Home Rule, the "Councils Bill," which was at once rejected in Ireland. The Irish party, which was out of touch with the new generation whom Sinn Féin was capturing, had its last chance of popularity in 1912, when Asquith brought in his Home Rule Bill; but difficulties arose on every hand. Protestant Ulster declared it must be excluded from the operation of the Act; and the Ulster Covenant and the forming of the Ulster volunteers led to the organizing in the S. of the national volunteers. The Dublin strike of 1913, led by James Larkin, failed and left great bitterness among the workers, among whom the citizen army was formed.

Edmund Curtis

There was every prospect of the passage of the Home Rule Bill in

1914, but during that spring it became clear that the dogged opposition of Unionist Ulster to the measure would be met by the no less dogged determination of the nationalist volunteers to uphold the measure of independence their party had won. Feeling was running high when the First Great War broke out. On Aug. 4, 1914, John Redmond pledged the support of Ireland to the Allied cause, and during the next two years Ireland, from N. and S., contributed some 250,000 soldiers to the British army. For a time it seemed as if Ireland and England were at last to be reconciled in this struggle against a common foe, but suddenly there came the Easter rising of 1916, a turning-point in Irish history.

Militarily the rising was almost insignificant. Only a few hundred men took part in the Dublin fighting, members of the Irish volunteers, a secession from the national volunteers, led by Patrick Pearse and Thomas Macdonagh, and members of the citizen army, led by James Connolly. They seized several strategic points in the capital, and proclaimed the establishment of an Irish republic with a provisional government, but within a week their forces had been defeated. There was serious destruction in the course of the fighting, and the casualties numbered over 440 military and about 800 civilians. Outside of Dublin the attempted risings reached no serious proportions.

When sixteen of the leaders were shot by sentence of British courts-martial and hundreds of their followers deported, the names of Pearse, Joseph Plunkett, and Connolly were set with those of Emmett and Wolfe Tone in the Nationalist martyrology. Until this time Sinn Féin had been a small and almost unknown body; it had not itself planned the rising,

but henceforth its growth was so rapid that it became of prime importance in Irish affairs.

By Nov., 1917, Sinn Féin had captured three Nationalist seats, and had stood definitely for an independent Irish republic. During that winter the National Convention, a body of 90 members representative of all creeds and parties save Sinn Féin, met in Dublin to consider a practicable constitution for Ireland. Nationalists and the moderate Unionists were united, but its report, signed early in April, 1918, bore no fruit. The Nationalist party, led by John Dillon since the death of John Redmond in March, seemed to have lost all its old power in the country. The decision in April to extend the Military Service Acts to Ireland still further increased the new movement, and at the general election in Dec., 1918, Sinn Féin carried 73 seats, as against six Nationalists, one Independent, and 25 Unionists.

Meeting of Dáil Eireann

These 73 members thus constitutionally elected were pledged to abstain from taking their seats at Westminster, but to remain in Ireland to establish a republic. On Jan. 29, 1919, a meeting of the 29 members who were not interned or imprisoned was held in the Mansion House, Dublin. They constituted themselves as Dáil Eireann



Ireland. Map illustrating the division of the country into septs as they were established at the beginning of the 16th century

(*q.v.*), issued a declaration of independence, nominated delegates to the Peace Conference, and announced the formulation of a programme of economic and general policy. A loan was launched in aid of the republic, subscribed to both in Ireland and in America. Thenceforth Sinn Féin consolidated its position. It organized a commission to investigate economic problems of the country, and in the early part of 1920 succeeded in establishing courts of arbitration for civil suits and criminal courts in many parts of Ireland. Its general policy was to build up an administration of its own which would supplant the British system, and so to bring about its recognition as an independent state.

Reprisals and Counter-reprisals

Meanwhile outrage had been showing itself. Repression of the movement was followed by the murders of crown officials and of many constables. The strength of British troops in Ireland was greatly increased; the Royal Irish Constabulary were reinforced by auxiliary armed police recruited in Great Britain (the Black-and-Tans). Their violent methods served to increase the hatred of British rule where it had not previously been strongly felt. The Sinn Féin leaders, headed in the absence of the president, De Valera, by Arthur Griffith, lost control of their extremist wing; certain elements in the crown forces took the law into their own hands, and the later months of 1920 saw a tragic series of reprisals and counter-reprisals between the crown forces and the Irish republican army, whose intangibility was its greatest source of strength. The policy of reprisals was for a time sanctioned by the British government. Sectarian riots in the N. added to the bitterness on both sides. Sinn Féin and all allied bodies were proclaimed as illegal associations. In Dec., 1920, the British government passed its Government of Ireland Act. This set up two parliaments, one for Southern and one for Northern Ireland. Northern Ireland accepted the scheme and its parliament, having been elected in May, 1921, was opened by King George in June. The rest of Ireland, however, refused to accept the Act, and the deadlock, with its accompanying acts of terrorism, not only in Ireland but in England, continued for some months longer.

Negotiations between representatives of the republic and members of the British Cabinet led to

a settlement. This took the form of a treaty signed on Dec. 6, 1921, which gave the republicans almost all they asked. It was embodied in an Act of parliament passed in 1922, but before then a provisional government had been set up and the Irish Free State was in being.

Bibliography. Ireland under the Tudors, R. Bagwell, 1885-90; History of Ireland in the 18th Cent., 5 vols., W. E. H. Lecky, repr. 1908-12; Ireland under the Stuarts and during the Interregnum, 3 vols., R. Bagwell, 1909-16; Ireland under the Normans, 1169-1216, 2 vols., G. H. Orpen, 1911; The Provinces of Ireland, ed. G. Fletcher, 5 vols., 1921-22; Sources of the Early Hist. of Ireland (Vol. 1, Ecclesiastical), J. F. Kenney, 1930; History of Ireland and her People, E. Hull, 1927-31; The Face of Ireland, M. Floyd, 1937; Ancient Ireland, R. A. S. Macalister, 1942.

LITERATURE. It is customary to divide the history of Irish literature into the three main stages, marked by known linguistic developments: Old Irish, c. 700-1100; Middle Irish, c. 1100-1550; and Modern Irish, from 1550 onwards. These medieval periods are singularly rich in both prose and verse, religious and secular, and the literary fame of Ireland stood high. By far the greatest works were the sagas of Cuchullin, in the Ulster cycle, and of Finn, in the Leinster-Munster cycle (see Gaelic Language and Literature), tales which have never ceased to be a living force in the song and story of native Ireland. In early Irish society the men who preserved the oral tradition of the poems and legends formed a class of great influence, known as the *Filid*; they were graded according to the quality and number of their tales, and were respected as priests or noblemen.

Decay of Language and Literature

But with the disappearance of the old civilization, with its *filid* and bards of the native kings, under English influences, Irish literature fell into a comparative decline. During the 17th and 18th centuries many poets flourished, some satiric, some patriotic, some influenced by Jacobite sentiment, but few had lasting popularity; the names of Geoffrey Keating, Pierce Ferriter, John O'Neaghtan, Brian Merriman, John Macdonnell, and Owen Roe O'Sullivan are among those still remembered. The decay in the spoken language, and to some degree the absorption of intellectual energies by politics, left the field of the arts even less tilled in the 19th century. -

ANGLO-IRISH LITERATURE. From the late 18th century down to the 20th, the chief expression of the literary genius of Ireland has been in English. But most of the work thus produced, from Tom Moore and Gerald Griffin down to Yeats and Synge, must nevertheless be counted as part of the national literature; in subject and style the tradition of this succession of poets, dramatists, and novelists is as distinctively Irish as that of Burns or Fiona Macleod is Scottish. There are a few, such as Swift, Sheridan, or Bernard Shaw, who stand apart as notable figures in English literary history, owing their peculiar talents to their Irish birth; but the Anglo-Irish writers proper have to their credit work which entitles them to separate consideration.

Moore and Lever

The first half of the 19th century saw great literary activity. The novels of Maria Edgeworth, within their somewhat restricted compass, gave a clear picture of her own days, and the poems of Tom Moore fashioned the sentiment and patriotism of his country into a form which became part of the literary currency of the period. A little later came the roystering novels of Samuel Lover and Charles Lever, who were responsible for the deceptive portrait of the Irishman as a devil-may-care humorist. The tales of Thomas Carleton are perhaps more true to the life they depict than those of his better-known contemporaries. Less widely known outside of Ireland are such men as Gavan Duffy, Thomas Davis, and J. S. Le Fanu, poets and political writers centring upon The Nation, a nationalist weekly founded in 1842.

The middle years of the century were years of sterility, but its closing decade brought the noteworthy Irish revival. This movement reflected the reawakening interest in the old Celtic tradition and mythology of Ireland. Its early inspiration is to be found in the poems of Sir Samuel Ferguson, later in the writings of Standish O'Grady, Douglas Hyde, and Lady Augusta Gregory, who strove to keep alive and to spread among the Irish people a knowledge of the heroic cycles and folk poetry of their great past. Round the Irish National Theatre, founded in Dublin in 1899, were centred such figures as Edward Martyn, W. B. Yeats, and J. M. Synge, who used his knowledge of the peasant idiom to fashion plays of great beauty and power. (See

Abbey Theatre.) Other prominent names are those of George Russell ("A. E."), at once poet, painter, and economist, and George Moore, who gave a brilliant though half-satiric account of the personalities of the revival in his *Hail and Farewell* trilogy.

James Stephens wrote prose and verse of fine distinction: in fiction the strongest tendency, as shown in the novels of the early James Joyce and Liam O'Flaherty, moved towards harsh realism, in marked contrast to the glammers of a few years before, but born perhaps of a deeper realization of the Irish spirit than was given to their romantic or humorous predecessors. See *Eire: Language and Literature*.

J. E. Miles

Ireland, BANK OF. Oldest existing Irish bank, established by Act of parliament in 1783, and until 1845 the only bank in Dublin allowed to issue notes. It has branches in Eire and N. Ireland, issuing consolidated bank notes in the former, and its own notes in the latter. Its head office is in College Green, Dublin. Until 1935 the liability of stockholders was unlimited; since that date, only in respect of note issue. In 1926 it acquired the shares of the National Land Bank, founded by the *Dáil* in 1920.

Ireland, CHIEF SECRETARY FOR. Member of the British government until 1922, responsible to parliament for affairs in Ireland. Theoretically he was only the chief secretary to the lord-lieutenant, but in practice he became more significant than his nominal chief. His importance began with the union of the parliaments in 1801.

Ireland, CHURCH OF. The name given to the Church that until 1869 was the established Church of Ireland. It belongs to the Anglican group of churches, resembling the Church of England in doctrines and practice. At the Reformation the organization and property of the church in Ireland were secured by those who adopted the reformed faith. Acts of supremacy and uniformity were passed, most of the existing bishops took the oaths, and thus the episcopal succession was maintained. In this way the church can claim to be the one founded, it is said, by S. Patrick, although after the Reformation it never possessed the adherence of more than a minority. The first Supremacy Act for Ireland was passed in 1537, but the church did not take its permanent form until the time of Elizabeth.

In 1800 it was united by the Act of Union with the Church of England, and some of its prelates took their seats in the house of lords; previously they had been members of the Irish house of lords. In 1833 the number of archbishops was reduced from four to two, and of bishops from 18 to 10, two dioceses in several places being united. The unpopularity of the church at this time was largely due to its possession of the tithes, but this was partly remedied by an Act of 1838 which transferred their payment from the occupiers of the land to the owners.

In 1868 a royal commission on the revenues and condition of the church reported, and in 1869 the bill for disestablishment became law. The Act abolished the jurisdiction of the bishops, except in purely ecclesiastical matters, and deprived them of their seats in the house of lords. It took away the endowments of the church, save £500,000, which represented private benefactions. The rights of existing bishops and clergy to their incomes were secured for their terms of office, and provision was made for the stipends of their successors.

Following the Act a constitution was established for the church. Its governing body is the general synod; this consists of a house of bishops and a house of clerical and lay delegates, its number being 216 clergymen and 432 laymen; the synod meets every year in Dublin. Each diocese has its own synod which elects the bishop, save in certain conditions where the duty falls to the house of bishops. That house chooses the primate. There are also diocesan councils. Incumbents are chosen by boards of nomination; three members represent the parish and three the diocese; the bishop is the seventh. The funds of the church, altogether about £11 millions, are administered by the representative body, controlled by the general synod. This consists of the archbishops and bishops, 13 clergymen and 26 laymen from the general synod, together with 13 coopted members. The church is divided into two provinces and 13 dioceses. See *Anglicanism*; *Church of England*.

Ireland, NATIONAL UNIVERSITY OF. Irish university, founded in 1908. It arose owing to the demand of the Irish Roman Catholics for university education, and is in a sense the successor of the Royal University of Ireland, dissolved in that year. It comprises two colleges of the Royal university, at

Cork and Galway; while a third university college was opened in Dublin. Eamon De Valera is the chancellor. Irish is obligatory at the matriculation examination.

Ireland, PROVINCIAL BANK OF. Commercial bank, with branches in both Eire and N. Ireland. Founded 1825, it was registered as a limited co. 1882. The head office is in London. The bank issues consolidated bank notes in Eire and its own notes in N. Ireland.

Ireland, REPUBLIC OF (Irish, *Poblacht na h'Eireann*). Name since 1948 of the country known from 1922 to 1937 as the Irish Free State, and from 1937 as Eire. The last links between Eire and the British crown and Commonwealth were severed with the passing by the *Dáil* of the Republic of Ireland Act, Dec. 21, 1948, which came into force at midnight April 17-18, 1949. The secession was recognized by the U.K. parl. in the Ireland Act, given royal assent June 2, 1949, with effect from April 18. See *Eire* in N.V.

Ireland, JOHN (b. 1879). British composer. Born at Bowden, Cheshire, Aug. 13, 1879, he was



John Ireland,
British composer

educated at Leeds grammar school, and studied composition under Stanford at the R.C.M. His first important work, *The Forgotten Rite*, was performed in 1912; his second sonata for violin and piano, 1917, established his reputation. Though often impressionistic in feeling, Ireland's work is classical in style. His chief compositions include the symphonic rhapsody, *Mai-Dun*, 1921; sonata for cello and piano, 1923; piano concerto, 1930; *Legend* for piano and orchestra, 1934; London overture, 1936; *These Things Shall Be*, for chorus and orchestra, 1937; *Concertino Pastorale* for string orchestra, 1939; *Epic march*, 1942. Of his numerous songs the setting of Massfield's *Sea Fever* attained greatest popularity. Ireland was professor of composition at the R.C.M.

Ireland, WILLIAM HENRY (1777-1835). English forger of Shakespearian manuscripts. Born in London, son of a seller of second-hand books and prints, at 17 he deceived his father with a fictitious old lease bearing the autograph of Shakespeare. He then produced a succession of Shakespearian forgeries, consisting of private letters

and annotations on fly-leaves of books, which deceived such men as Boswell and Pye, the poet laureate. Young Ireland declared that they had been given him by a wealthy gentleman whom he knew only by his initials. The climax was reached when he presented his father with a whole play entitled *Vortigern*, alleged to be the work of Shakespeare. The play was actually produced by Sheridan, with Kemble in the cast, at Drury Lane on April 2, 1796. It was a total failure, and this, combined with the growing doubts as to the authenticity of Ireland's Shakespearian relics, demolished the fabric of fraud. Ireland confessed his guilt, publishing a volume entitled *Confessions* in 1805. Thereafter he dragged out a precarious existence, writing novels, poems, and miscellaneous works until his death, April 17, 1835. Ireland's forgeries form the theme of James Payn's novel *The Talk of the Town*, 1885.

Irenaeus (c. 130-202). Saint and bishop of Lyons. He is supposed to have been born at Smyrna (now Izmir) and educated under Polycarp. Coming to France in early manhood he became a priest at Lyons, succeeding Pothinus in the bishopric in 177. He preached Christianity to the Gauls, and helped to settle the dispute between the bishop of Rome and the Asiatic Churches on the question of the date of Easter. He is said to have been martyred under Severus. Irenaeus wrote in Greek a treatise against heresies, some fragments of which together with a complete Latin version are extant. Canonised, he has a festival June 28.

Irēnē (Gr. *Eirēnē*). In Greek mythology, the goddess of peace, daughter of Zeus and Themis. She was worshipped by the Romans under the name of Pax. The word is a fairly common Christian name, having been introduced into England from Russia. *Pron.* I-ree-nee.

Irene (752-803). An east Roman empress 797-802. Of a distinguished Athenian family, she became the wife of Leo IV. After his death in 780 she acted as regent for their son Constantine VI. Irene was a strong anti-iconoclast, and at the council of Nicaea, 787, the worship of images was restored. When Constantine attempted to free himself from her control she had his eyes put out, and for five years reigned alone. Charlemagne contemplated marriage with her in order to unite the two empires, but disgust with her government by favourites led to a conspiracy, and

she was deposed and banished to the island of Lesbos, where she died.

Irene was also the name of the wife of Alexius I Comnenus.

Ireton, HENRY (1611-51). English soldier. Born at Attenborough, near Nottingham, he was educated



H. Ireton

at Trinity College, Oxford, studied law, and was living in London when the Civil War began. He joined the parliamentary forces and was soon associated with Cromwell in Lincolnshire. He was at Marston Moor and Newbury; at Naseby he led the left wing of the parliamentary army, being routed and made prisoner, only to be released by the victorious Cromwell.

In 1645 Ireton entered parliament as M.P. for Appleby. He drafted the Heads of the Proposals and his efforts were directed towards bringing about peace by reuniting the moderate men of both parties. When this failed he took an active part in the renewal of war, and was one of the king's judges, signing the death warrant. Later in 1649 Ireton went to Ireland, and when Cromwell returned was left as lord deputy. He had taken Waterford and Limerick, when he died of the plague, Nov. 26, 1651. He was buried in Westminster Abbey, but at the Restoration the body was exhumed and hanged at Tyburn. In 1646 Ireton married Cromwell's daughter, Bridget.

Irgun. Jewish terrorist organization, the full title of which was Irgun Zvi Le-umi C'Eretz Israel (national military organization in the land of Israel). It began as the fighting force of the right-wing revisionists, who during the Arab disturbances in Palestine (1936-39) decided to retaliate against the Arabs, despite the official Jewish policy of self-restraint. After the Second Great War, Irgun initiated a campaign of murder, kidnapping, and destruction with a view to compelling the British government to set up a Jewish state in Palestine and Transjordan. It was disowned by the Jewish agency for Palestine, and outlawed by the Israeli govt., 1948. Assuming the name Heruth (freedom) party, it secured 14 of the 120 seats in the first Israeli parliament in 1949.

Iridaceae. A family of perennial herbs, with a thick, creeping rootstock, or forming a tuber or corm. The leaves are sword-shaped or grass-like, the bases often folding over younger leaves. The flowers are regular or irregular, and the sepals and petals coloured alike and united at the base. There are three stamens; the ovary is three-celled; and the capsule three-sided, three-celled, and three-valved, containing numerous seeds. Iridaceae are widely distributed, mostly in countries outside the tropics. The iris, crocus, and gladiolus belong to the family.

Iridescence (Gr. *iris*, rainbow). Intermingling and interchange of the spectrum colours on surfaces. Typical surfaces which produce iridescence are those of soap bubbles or mother-of-pearl. Minute irregularities of the surface, in reflecting white light, split it up into its constituent colours by the phenomenon of interference.

A beautiful meteorological phenomenon is the rarely seen iridescent or mother-of-pearl cloud. These lenticular shaped clouds, consisting of minute water drops cooled to well below freezing point, lie within the stratosphere, between 13 and 18 miles above the earth. The strongest prismatic colorations have been observed either shortly after sunset or just before sunrise, at angular distances up to 40° from the sun. Mother-of-pearl clouds apparently occur most frequently in winter over Norway. The iridescence is probably due to diffraction of light by the small water drops.

A mineral shows iridescence when it exhibits a play of prismatic colours in its interior or on its surface. This may be due to the presence of oriented minute inclusions, but more generally is caused by interference phenomena of light reflected from the fine cleavage-lamellae. This is analogous to the well-known Newton's rings (*q.v.*).

Iridium (Gr. *iris*, rainbow). One of the metals of the platinum group. Discovered in 1804 by Tennant, it occurs in nature as the elemental metal in alloys with platinum, grains of which are found in the platinum mines in the Urals, Burma, and at Sudbury, Ont. It is obtained chiefly as a by-product from the residues from electrolytic refineries of nickel and copper. It is always associated with other metals, particularly osmium, and the separation is intricate. A series of extractions with acids and fusions is performed

and finally ammonium chlor-iridate is obtained, purified by fractional crystallisation and ignited in hydrogen to give pure iridium. The extraction is considered in greater detail under the heading platinum (*q.v.*). Iridium and osmium sometimes occur in gold dust.

The element, chemical symbol Ir, is in the eighth group of the periodic table. The atomic number is 77; atomic weight, 193.1; melting point, 2,435° C.; boiling point, about 4,400° C.; crystal form, face-centred cube, with lattice constant $a = 3.831$, and an interatomic distance of 2.709 Ångström units. The metal is white and looks like steel, but is extremely hard and brittle, with a Brinell hardness of 172 as cast. The compact metal is insoluble in all acids, although aqua regia will dissolve the powder slowly. It may be worked at white heat into wire or rod, and iridium crucibles have been used for analytical work. If 7 p.c. of phosphorus is added, the alloy is much more fusible and is used for tipping the nibs of fountain pens. Added to platinum in amounts between 10 and 25 p.c. iridium yields a hard alloy, used for magnetic points in aircraft, all forms of electrical contacts, fine bearings for compasses and watches, and standard weights and measures.

Iridosmine or **OSMIRIDIUM**. Mineral containing iridium and osmium in different proportions, forming an isomorphous series. Members containing more iridium than osmium are called iridosmine; when osmium is in excess the name is siserskite. It occurs as irregular flattened grains (crystal, rhombohedral) with tin-white to steel-grey colour, metallic lustre, high specific gravity. It is found with platinum in various parts of the U.S.S.R.; in gold-bearing conglomerates of the Rand, S. Africa; and in gold sands of California.

Irigoyen, **HIPOLITO** (c. 1855-1933). Argentine statesman. Born of Spanish-Basque stock at Buenos Aires, he was educated there, and in 1878 was elected to the provincial legislature. For 30 years leader of the radical party, he became president in 1916, preserving Argentinian neutrality in the First Great War, and persevering with his policy of social pacification. He resigned in 1922, but his prestige with the working classes again brought him the presidency in 1928. He negotiated the D'Abernon trade agreement with Great

Britain, 1929. But his second period of office was marked by autocratic tendencies and political corruption, culminating in his overthrow by revolution on Sept. 6, 1930. He died July 3, 1933.

Iris (Gr., rainbow). In Greek mythology, the messenger of the gods, more especially of Hera, and the personification of the rainbow.

Iris. One of the asteroids, seventh in order of discovery. It was first observed by Hind in 1847. See Asteroids.

Iris. Large genus of perennial herbs often referred to as flags. Of the two sections, gardeners regard the rhizomatous sections as flags and the bulbous section as irises. The latter are separated into English irises and Spanish irises; but no bulbous iris is a native of the U.K. The common flag of our gardens with purple flowers is *Iris germanica* from Central and S. Europe, introduced as far back as 1573. It will do well anywhere, under most unpromising conditions, but abundantly repays a little care. The Florentine flag (*I. florentina*), with delicate lavender-tinted flowers, furnishes the orris-root of the druggist and perfumer. The golden flag (*I. aurea*) comes from the W. Himalayas. Japanese flag (*I. laevigata*), with magnificent bright purple flowers, is most suitable for the edges of ponds, where it will get abundant moisture. Primrose flag (*I. champeiris*) has pale yellow flowers netted with purple-brown, and the dwarf flag (*I. pumila*), though its lilac-purple flowers are large, is only about 5 ins. high. All these should be planted by preference in light, rich soil with the upper part of the rhizomes exposed. The so-called English and Spanish irises, with their Asiatic relations and numerous garden varieties, should be planted in clumps deeply in well-drained sandy soil and left undisturbed. See Flag; Gladwyn.

Iris. The membrane surrounding the pupil of the eye. It has the power of contracting or enlarging in order to regulate the amount of light which enters the eye, and also acts as a diaphragm to cut off rays passing through the margin of the lens and thus lessen spherical aberration when a clear image of a near object is required. The outer layer of the iris is pigmented in black or brown eyed people but lacks pigment in the blue eyed.

Iritis, or inflammation of the iris, may be acute or chronic. The condition may follow an injury to the eye, but is more frequently due to

tuberculosis, syphilis, gonorrhoea, or other toxic cause. In acute cases there is severe pain, with contraction of the pupil, changes in the colour of the iris, loss of lustre, dimness of vision, intolerance of light, and constant watering of the eye. There is often a zone of redness round the margin of the pupil. Any inflammation of the eye should be seen by a physician, for failure to diagnose this condition correctly can lead to serious consequences.

In photography an iris diaphragm provides a means of controlling the size of the aperture in a lens, a circle at the centre of the lens opening and closing like the iris of the eye. See Eye; Lens.

Irish Academy, **ROYAL**. Irish learned society. Dating from 1782, when some members of Dublin university started weekly meetings "for promoting the study of science, polite literature, and antiquities," it received a charter from the king in 1786, and in 1788 began to issue its Transactions. It possesses a valuable library, especially rich in MSS. of the early history, antiquities, and language of Ireland, including the famous Annals of the Four Masters. The headquarters are at 19, Dawson Street, Dublin.

Irish Bases. Collective name given to the former British naval bases at Cobh, Lough Swilly, and Berehaven. These bases were essential to the defence of the western approaches in the First Great War both for anti-submarine patrols and as centres of the Admiralty ship-salvage organization. Under the Anglo-Irish treaty of 1921, the defence by sea of Great Britain and Ireland was undertaken by Imperial forces until arrangements had been made whereby the Irish Free State took over her own coastal defences. The latter government agreed to give the necessary harbour facilities to the Royal Navy. By the Anglo-Irish agreement of 1938, Eire became responsible for her coastal defence, the U.K. handing over the Admiralty property and rights at Berehaven, Cobh, and Lough Swilly. The transfer was originally fixed for Dec., but in view of the uncertain international situation the bases were taken over by Eire on Sept. 29.

When Eire declared her neutrality at the outbreak of the Second Great War, she declined to grant the Royal Navy any facilities for bases. Lack of facilities for combating German submarine and aircraft activity in the Irish Sea and

the Atlantic approaches obliged the British and U.S. governments to build a large naval and air base at Londonderry, but this was of less value strategically than the former bases in Eire. A suggestion in 1941 that these should be leased by the Allies was dismissed by Eamon De Valera. Opposition from the Irish population in the U.S.A. prevented the naval authorities reaching an agreement to take over the bases in exchange for economic assistance to Eire.

Irish Free State (Saorstát Eireann). Name under which the state known since 1937 as Eire (*q.v.*) achieved independence from Great Britain by the treaty signed on Dec. 6, 1921.

Irish Fusiliers, ROYAL. Regt. of the British army. It was formed in 1881 by amalgamating the 87th and 89th Foot. The



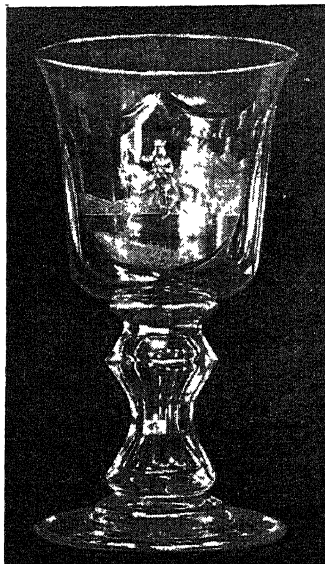
Irish Fusiliers badge

87th was raised in 1793 and fought on the Continent the following year. It served with Abercromby in Egypt and won eight battle honours under Wellington in the Peninsula. Sergeant Masterson in this campaign captured the first French eagle taken by the British army. It then took part in the Crimean War, the Egyptian campaign of 1882, the Burmese War of 1885, and in the S. African War was at the relief of Ladysmith.

Fourteen battalions were raised for service in the First Great War and gained the honours: Le Cateau; Marne, 1914; Ypres, 1915, '17, '18; Somme, 1916, '18; Arras, 1917; Messines, 1917, '18; Lys; Macedonia, 1915, '17; Suvla; Palestine. In 1922 the regiment was reduced to one battalion and linked with the Royal Inniskilling Fusiliers for administrative purposes. In 1937 it resumed independent existence with two battalions, of which one served in Africa and Italy and the other in Burma during the course of the Second Great War.

Irish Glass. Fine glassware produced in Ireland. The glass-making industry has practically ceased in that country where at one time it was flourishing. Its origins date from shortly after the introduction of glass-making into England, about the middle of the 14th century. Flint-glass was invented early in the 17th century.

This kind of glass, of which a main constituent is oxide of lead,



Irish Glass. Goblet, formerly belonging to an Orange Lodge, in the Dublin Museum

From Irish Glass, by Dudley Westropp. By permission of Herbert Jenkins, Ltd., York Street, St. James's, London

appealed especially to the Irish craftsman, since the material was found in abundance in his country, and flint-glass lent itself, as Venetian and other continental varieties did not, to the art of glass-cutting. In the 18th century there were 22 flint-glass factories in Ireland, mainly at Waterford, Cork, and Newry. Among them was the famous glass house at Waterford. By the beginning of the 19th century the number of manufactories had been reduced to 15, and most of these had vanished by 1850. The glass house was closed down shortly afterwards owing to a strike of the operatives.

Waterford glass, so much prized by connoisseurs, was at its best during the late 18th and 19th centuries. Specimens of this date are often exquisitely cut, and always have a characteristic and unmistakable tinge of smokiness due to the excessive presence of oxide of lead. Cork-made glass is duller than Waterford, with a pale yellowish tinge, and old Belfast glass is also yellowish. Waterford glass is the heaviest of these varieties. Tint and weight apart, the style of all three is much the same. The cutting tends to be shallow, and its lines can be described as curved and flowing, as opposed to the English style of diamond-shaped cutting.

Irish Guards. Regiment of the British army. Formed in 1900 to acknowledge the gallantry of

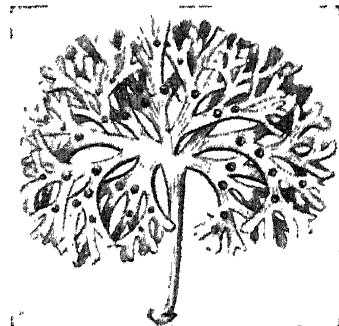
Irish regiments in the S. African War, it was raised from volunteers from the other regiments of Foot Guards and served through the remainder of the war as mounted infantry. Its first public function was to mount the guard of honour at the reception by the prince



Irish Guards badge

of Wales of Lord Roberts on the latter's return from S. Africa. The Irish Guards raised three battalions for service in the First Great War and won the battle honours: Retreat from Mons; Marne, 1914; Aisne, 1914; Ypres, 1914, '18; Festubert, 1915; Loos; Somme, 1916, '18; Hazebrouck; and Hindenburg Line. In the Second Great War, the Irish Guards covered the evacuation of Queen Wilhelmina and the Netherlands govt. from the Hook of Holland, and held Boulogne during the retreat to Dunkirk. The 1st battalion served in Norway, N. Africa, and Italy, and the 1st and 3rd battalions with the Guards armoured division in the liberation of Europe.

Irish Moss (*Chondrus crispus*). Small seaweed of the family Rhodophyceae, growing on rocks about low-water mark. The frond is flat, thick, and cartilaginous, repeatedly forking in one plane, varying in colour from greenish-white to dull purple. Under the name of carra-



Irish Moss. Frond of the seaweed formerly used for food

geen, its dry fronds, being gelatinous and easily digested, were formerly prescribed for invalids.

Irish Players. Popular name for the players associated with the Irish National Theatre Society. See Abbey Theatre.

Irish Regiment, ROYAL. Former unit of the British army. Raised in 1683 from independent companies, it became the 18th Foot and under William III fought at the Boyne and Limerick. It

greatly distinguished itself at the assault on Namur in 1695 and served with Marlborough at Blenheim.

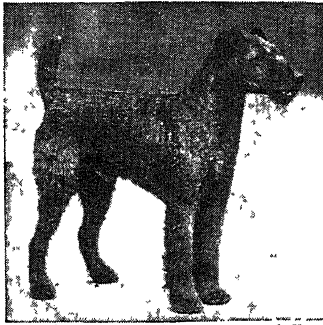


Royal Irish Regiment badge

The regiment fought under Abercromby in Egypt; in China, 1840; Burma; the Crimea; New Zealand, 1863-66; Afghanistan, 1879; Egypt, 1882; and S. Africa, 1899-1902. Nine battalions were raised in the First Great War, fighting in France, Flanders, Gallipoli, Palestine, and Macedonia. On the inauguration of the Irish Free State, the regiment was disbanded in 1922.

Irish Republican Army. The name given to Irish nationalist forces who carried on guerrilla warfare against British forces in Ireland (1916-21) and those of the Irish Free State (1922-23). The I.R.A.—which at the height of its power in 1920 never exceeded 15,000—was an offshoot of the Irish Volunteers formed in 1913 “to secure and maintain the rights and liberties common to all the people of Ireland.” In 1914 adherents succeeded in smuggling ashore, at Howth, some 1,500 second-hand rifles from Germany; from this may be dated the formation of a “military” force. All training was carried on in secret, mostly by night and in the mountains.

The Volunteers played, with the Irish Citizen Army, an important part in the Dublin rising of 1916. Soon afterwards they were reorganized and renamed. Until the Anglo-Irish treaty was signed on Dec. 6, 1921, they carried on an incessant struggle against British forces by ambush and assassination. On the establishment of the provisional government there was a serious cleavage in the I.R.A. ranks, many deserting from what was the legalised Free State army. These “irregulars” were directed by the Irish Republican Brotherhood against the government and made ready for civil war. In March, 1922, the I.R.A. repudiated the authority of the Dáil and occupied the Four Courts and Kilmainham gaol in Dublin, from which they were driven by Free State forces. Some I.R.A. leaders were executed and the organization was declared illegal. It continued active as an underground movement, aiming at the reunion of Ireland by force and its complete secession from the British Com-



Irish Terrier. Large, powerfully built dog, with strong sporting instincts

monwealth. In 1938-39, I.R.A. members perpetrated a series of bomb outrages in London and other English towns. In July, 1939, the British govt. expelled from Britain many I.R.A. members suspected of Nazi sympathies. Following an I.R.A. raid on Phoenix Park Arsenal, Dublin, in Dec. 1939, the Eire police rounded up and interned a number of I.R.A. suspects. The organization continued in existence, however, with a strength of some 5,000 governed by a supreme army council, or inner circle.

Irish Sea. That part of the shallow British seas situated between the S.W. of Scotland, the E. of Ireland, and the W. of England and Wales. It is connected with the Atlantic Ocean by the North Channel on the N. and S. George's Channel on the S. Its extreme breadth is 150 m.; and its mean depth is 210 ft.

Irish Setter. This sporting dog is similar to other varieties of the breed, except in colour, which is a rich golden chestnut. See Setter.

Irish Sweepstake. A public lottery organized in Eire for the purpose of financing hospitals. The sweepstakes are held on the principal English horseraces, the first having been drawn on the Manchester November Handicap for 1930. The draw takes place in the Mansion House, Dublin, with government support and under police supervision. At first the prizes ranged from £350,000 for the winner to 360 consolation prizes of £1,100; later the amount available was divided into units, several first prizes of £30,000, second of £20,000, and third of

£10,000, with extra prizes for starters and even for entries. The sale of tickets is illegal in the U.K.

Irish Terrier. Breed of large terrier. Ranging in weight from 18 lb. to 24 lb., it has a rough wiry coat, and in general build resembles the fox terrier, but is reddish brown in colour. It is exceedingly courageous, faithful, and affectionate. Few dogs show more enthusiasm for hunting, and it will chase almost anything that can run. The Irish terrier originated in a cross between the fox terrier and one or more of the rough-coated breeds, and first appeared about 1870. See Dog.

Irish Water Spaniel. Breed of sporting dogs. Unlike any other variety of the spaniel family, this



Irish Water Spaniel, a breed much used for rough shooting

dog is large, rather tall, with a short, smooth, tapering tail, and a distinctive coat of dense, tight, crisp ringlets. The colour is a rich puce liver. The gait also is characteristic, being a different movement from that of other varieties of spaniel. These animals combine great intelligence with endurance, but are not suitable household companions owing to their oily coats.

Irish Wolfhound. Breed of hunting dogs. One of the largest varieties of dog used in the chase, it stands about 32 ins. high at the shoulder, and weighs about 120 lb. Somewhat resembling a large,



Irish Wolfhound. Stately and imposing on account of its great size, this breed of sporting dog is also notable for its sagacity and its affectionate nature

heavily built, and rough-coated deerhound, it is believed to have existed in Ireland from an early period. In the 19th century the original breed, in anything like a pure strain, became extinct; and its revival is the result of scientific selection in crossing. The Irish wolfhound is suitable only for large breeders, as it is difficult to rear successfully, and its great size often renders it unmanageable.

Irkutsk. City of Asiatic Russia, capital of the East Siberian region. It stands on the right

gold, iron, coal, salt, and graphite, while grain and potatoes are cultivated. Pop. 243,380.

Irlam. Parish and urb. dist. of Lancashire, England. It stands on the Manchester Ship Canal, at the junction of the Irwell and the Mersey, 8 m. S.W. of Manchester. It is served by railway. Its industries are chiefly concerned with steel, engineering, soap, margarine, and market gardening. Pop. 14,800.

Irmin. Eponymous hero of the Hermiones, one of the three great branches of the ancient Teutonic race. He was regarded as one of the three sons of Mannus, and perhaps worshipped as a god. The Saxons, who were descended from the Hermiones, venerated a wooden pillar at Eresburg, in Westphalia, called the Irmin-sul, or pillar of Irmin, representing the mythical world-tree which supported the universe. The pillar was destroyed by Charlemagne in 772. The name is possibly connected with Ermine Street, an ancient highway which passed through the E. Midland counties of England.

modified by the addition of other metals to give alloy steels.

Some approximate output figures for 1946 show that the U.S.A. is by far the biggest producer of pig iron and ferro-alloys, production exceeding 40 million tons. Next is the U.K. with 7,764,000 tons. France produced 3,396,000 tons; Germany, formerly one of the biggest producers, 2,412,000 tons; Belgium, 2,136,000 tons; India, 1,428,000 tons; Luxembourg, 1,344,000 tons; Canada, 1,356,000 tons. Iron is of the first importance in industry and engineering, the study of its alloys being an important branch of science, ferrous metallurgy.

HISTORY. Iron has been known to man for many centuries, but it is still uncertain when he first used it for the manufacture of weapons and tools. Man's progress is supposed to have been from the Stone Age through the Bronze Age to the Iron Age, a division supported by two facts. First, very much higher temperatures are required to melt iron than to melt copper or its alloys from their ores. But iron can be made without fusion, by reduction of the iron oxide ore to wrought iron at considerably lower temperatures than must be used in copper smelting; this was the method used for making iron up to the middle of the 16th century. Secondly, while there are many relics of tools and weapons made from copper and bronze, there are few of iron dating from much before 1000 B.C. But this may be explained by the much more rapid corrosion of iron than of the copper alloys. Iron is mentioned in Egyptian texts dating from 3500 B.C. and there exist a piece of iron, taken from the pyramid of Kephron (3700 B.C.), now in the British Museum; a wrought iron sickle from the base of a sphinx at Thebes; a cross-cut saw blade, found near Nimrod and certainly earlier than 800 B.C.; and several other examples. Further, it seems unlikely that the gigantic stone-work, carried out by the ancient Egyptians, would have been possible with implements made from the comparatively soft metals copper and bronze. Iron ores are, moreover, very common all over the world, and the metallurgical operations for the primitive manufacture of wrought iron, as still practised by the Nigerian natives, are comparatively simple. It seems likely that the Iron and Bronze Ages overlapped considerably.



Irkutsk. The cathedral of the Virgin of Kazan, with five domes, and, on the left, the belfry

bank of the Angara, here navigable, and has a station on the Siberian rly. There is an air service to Yakutsk. Industries are concerned with iron ore, manganese, and gold founding. Large trade is done in tea and furs at the fair. The district is rich in

IRON: PROPERTIES AND PRODUCTION

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This article is concerned with the nature of the metal and its production. For the forms in which iron is used, see Cast Iron; Steel; Wrought Iron, etc. See also Blast Furnace; Catalan Forge; Cementation; Cupola; Iron Age; Iron and Steel Construction, etc.

Pure iron is a greyish-white magnetic metal. An element, with the chemical symbol Fe (Lat. *ferrum*), it is one of the transitional elements in the first long period of the periodic table with vanadium, chromium, manganese, cobalt, and nickel. Its atomic number is 26; its atomic weight, 55.84; melting point, 1,537° C.; boiling point 3,000° C.; specific gravity, 7.86; electrical resistivity, 9 to 15 microhms per centimeter cube; valencies, usually 2 or 3.

Iron exists in two crystalline forms—alpha-iron is body-centred cubic, with lattice constant, $a = 2.861$; gamma-iron is face-centred cubic, with lattice constant, $a = 3.56$. Gamma-iron is not stable at room temperature. Transition to alpha-iron or ferrite takes place at about 920° C. If heated to over 1,400° C. gamma-iron changes to delta-iron, which is again body-

centred cubic. Iron is strongly magnetic up to 769° C., at which point it loses its magnetism; this is known as the Curie point.

Iron rusts rapidly in air, particularly moist air, forming a red oxide, Fe_2O_3 . This may be converted to magnetic oxide, Fe_3O_4 , by the action of heat; the ferrous oxide, FeO , is also known. The metal is readily soluble in acids, producing ferrous and ferric salts, and it will combine with arsenic, phosphorus, and sulphur, giving compounds with lower melting points than the metal. It can be welded directly to itself without the intervention of a solder, and it alloys with most metals, being present in many metals and alloys of normal commercial purity, sometimes with deleterious effect. Combined with carbon it forms the wide range of alloys known as steels, and these steels can be

Iron in early ages was chiefly produced as wrought or malleable iron or steel, the manufacture of steel following naturally from the use of charcoal as fuel. However, in the light of certain passages of a manuscript, preserved at Lucca, Italy, it seems certain that liquid iron was tapped from furnaces and cast in Europe at least as early as the 8th century A.D. Even more remarkable is the discovery in 1946 by Professor K. Absolen of a prehistoric cast iron 2,500 years old, found in a smithy worked in the 6th century B.C., near Brno, Czechoslovakia. Georg Agricola, in *De Re Metallica*, 1556, describes three processes. The first is the primitive process of producing a pasty mass of reduced ore, which was hammered to squeeze out the slag and produce "bloom." The second process involves the use of a shaft furnace, "similar to a blast furnace, but much wider and higher, so that it may hold a great quantity of ore and much charcoal." The conditions in such a furnace would be similar to those in a forge on a larger scale. If the temperature were raised, iron would be produced, similar to cast iron, and Agricola does mention this, though he probably did not fully understand it. The subsequent production of malleable iron from this hard iron is the basis of the indirect method. Agricola's third process is the manufacture of steel by cementation, "which the Greeks call *stomōma*."

First Production of Molten Iron

The Catalan forge, said to have been designed in Catalonia, Spain, is similar to the furnaces used in Britain until the 14th century for the production of wrought iron direct from the ore. The first shaft furnaces, although roughly similar in design to the modern blast furnace, were still used only for wrought iron production. It is said that molten iron was first produced by accident owing to the higher temperatures attained when shaft furnaces were increased in size. This hard, brittle iron was thought undesirable by the makers and it was not until they found that their furnace would produce nothing else that they set to work to improve the "pig," so founding the modern iron and steel industry.

Charcoal was used as fuel in Great Britain until an act of 1584 was passed to preserve the woods of Sussex, Surrey, and Kent from the depredations of the iron makers. A few years later, in

1611, James I granted a patent to Simon Sturtevant for the use of "sea coale" or "pit coale," but it was not until 1619 that Dud Dudley of Worcestershire, amid much opposition from the charcoal iron masters, first produced iron with the aid of coke, made from coal. Although the Chinese had been using coke for many years, it was not until 1735 that Abraham Darby of Colebrookdale Ironworks, Shropshire, first used coke in a blast furnace. In 1784 rolls were introduced by Henry Cort, and the production of wrought iron was further facilitated by his puddling process.

Invention of Hot Blast

James Neilson invented the hot blast in 1828. His idea was to use the waste heat from the gases escaping from the top of the furnace for preheating the air blast introduced at the bottom. This opened the way for the development of blast furnaces producing as much as 1,000 tons of pig iron per day. The Bessemer process, introduced in 1856, was followed by the Siemens-Martin open hearth process, since when developments have been confined to mechanical improvements and increases in the scale and scope of operations.

RAW MATERIALS. The primary requirement for the production of pig iron, first product in the manufacture of iron and steel, is a good iron ore. Clarke showed that 4.64 p.c. by weight of the earth is iron. It is one of the four most common elements in the earth's crust, the others being oxygen, silicon, and aluminium. But for the ore to be workable, the iron must be present in such a mineralogical state and quantity that it can economically be extracted. The most important ores are haematite, Fe_2O_3 , magnetite, Fe_3O_4 , limonite, $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$, and siderite, FeCO_3 , of which the richest is magnetite, containing 72.4 p.c. of iron. Iron probably never occurs native, except in meteorites, when it is usually associated with nickel, although claims have been made that native iron has been found in German mines and in W. Africa. Pyrites, the iron sulphide, is very common, but it is important chiefly because of its sulphur content, 53.3 p.c., which makes it suitable for the manufacture of sulphuric acid. Red haematites from the Lake Superior district and magnetites are rich sources of iron ore in the U.S.A. The U.K. mines haematite and carbonate

ores; while the bulk of the iron ores of Germany are acid deposits. Other producers are France, Spain (whence comes the famous Bilbao ore), Norway and Sweden (where there are exceptionally pure magnetic ores), Italy, China (where the iron industry is the oldest in the world), Canada, and India.

Methods of mining and handling the ore vary with the position and nature of the deposit. It is sometimes necessary to improve the ore either by increasing the metal content or by removing some objectionable material, such as sulphur or phosphorus. The methods used for beneficiation must be cheap and are usually restricted to hand-picking, drying, roasting or calcination, washing or jigging, to remove excess clay, magnetic separation, and agglomeration. The saving in cost of transport of the improved ore often pays for the beneficiation processes.

Coke as Furnace Fuel

The other raw materials needed are fuel, fluxes, and air. Coke is universally used as a blast furnace fuel, though occasionally some anthracite is added. The chemical composition, that is, the moisture, ash, sulphur, volatile contents, etc., of coke used in blast furnaces is important, but its physical properties are more so. It must be hard and resistant to abrasion or it will not withstand the immense pressures in the furnace, and it must at the same time be porous and readily combustible. Study of such factors has reduced the fuel consumption from 1 ton to 17 cwt. per ton of pig iron, with a consequent saving in cost. Coal washing has also improved the quality of the coke. Most British iron makers make their own coke on the site of the blast furnace.

Flux must be added to the furnace to help the unwanted gangue minerals in the ore and in the ash from the coke to form a readily fusible slag, which can be tapped from the furnace. Most of the impurities are acidic in their chemical nature and so a basic material is chosen as a flux, usually limestone. Limestones vary widely in composition, but the content of calcium carbonate varies from 30 to 95 p.c. and of this 56 p.c. is lime and useful for fluxing. Often some magnesia is present and, in fact, dolomite is sometimes used, a mixed magnesium, calcium carbonate. Magnesia gives a slag with a lower

melting point, however, and so is not always desirable.

Air is an important raw material, and variations in its quantity and quality can completely upset the running of a blast furnace. This is not surprising when it is considered that to produce one ton of pig iron, the materials needed are approx. 2 tons of ore, $\frac{1}{2}$ ton of flux, 1 ton of fuel, and 4 tons of air, yielding, in addition to the pig, $1\frac{1}{2}$ tons of slag and $5\frac{1}{2}$ tons of blast furnace gas. A large blast furnace might produce up to 1 ton of pig iron per min. and so, with air of normal humidity, 5 galls. of water, or more, is pumped into the furnace in the same time. The ideal would be to remove all this water, but practical difficulties have made this economically impossible. Therefore an even supply is aimed at, fluctuations causing unsteady working. The air is preheated, with a consequent increase in production and reduction in cost and fuel consumption. Neilson found that by raising the temp. of the air by 600° F. he decreased fuel consumption from 8 to 2 tons of coal per ton of iron, and temps. now used exceed 1,000° F. The preheating is carried out by a series of stoves, containing a chequer-work of refractory bricks.

Method of Forced Draught

One set of stoves is heated by burning the hot gases from the top of the furnace while the other is preheating the air: periodically the positions are reversed, so that the air is kept at a reasonably constant temperature. Natural draught would obviously be insufficient to force this amount of air into a furnace. The bellows used of old have been replaced by huge blowing engines, handling as much as 45,000 cu. ft. of air per min. at a pressure of 15 to 20 lb. per sq. in. Either gas engines or steam turbo-blowers are used for this operation.

PRODUCTION. The design and working of a blast furnace are described under that heading; many excellent examples may be seen in Great Britain, particularly in the "black country" of the Midlands. The structural design must be sound and the foundations heavy, as the furnace carries as much as 3,000 tons of material, and pressures on the hearth exceed 50 lb. per sq. in. A blast furnace takes nearly a month to start, but, once fully working, will remain so for 2, 3, or even 5 years. Its products are slag, which is crushed and used for the manufac-

ture of cement, and pig iron. From the latter are made wrought iron, cast iron, steel, alloy steels, etc. Pig iron varies in composition according to the material with which the blast furnace is charged, and this variation is controlled to produce a pig iron suitable for the purpose for which it is to be used. At one time the pig iron was cast into sand moulds, and an examination of the fracture showed the quality of the iron. In modern practice the bulk of the pig iron for steel making is never cast at all; it is carried in large ladles on a "hot metal car" direct to the open hearth or electric furnace or to the Bessemer converter. If it is to be chilled, casting machines with iron moulds which can be rapidly cooled are used. Pig iron contains 3.5 to 4 per cent of carbon with varying amounts of silicon, sulphur, phosphorus, and manganese (see table in p. 1210).

How Wrought Iron is Made

Wrought iron contains very little carbon and most of the impurities are concentrated in the slag inclusions. It is made from pig iron by a process very similar to that used by the old iron masters for making iron direct from the ore. The pig iron is melted down, the silicon oxidised, forming a slag, and is then "boiled," removing carbon as the dioxide; the iron is then "brought to nature," when small balls begin to form, and then "balled up," the balls being hammered in a mechanical hammer. After this "shingling," the "puddled bloom" is rolled and re-rolled into "merchant bars." Wrought iron is very malleable and ductile, easily welded and resistant to corrosion. By contrast, cast iron is very hard and brittle, largely because of the high carbon content, which is similar to that of pig iron, but more in the combined state as cementite, which is extremely hard. It is made by melting pig iron with limestone and coke in a cupola, which is cheap and easy to run, but is being replaced by the reverberatory furnace or electric arc furnace, both of which can be closely controlled and give a purer product. Malleable cast iron can be made by removing some of the carbon and making the remainder more finely divided and graphitic. The white heart process, favoured in Great Britain, involves packing the iron in boxes with haematite ore and heating for some days, some of the carbon being oxidised. The Americans prefer the black heart process, where a neutral packing agent is used and no

carbon is removed; it is all converted to temper carbon or graphite, and the mass cooled very slowly. The purest form of iron available commercially was evolved by an American company for the manufacture of galvanised sheet and wire. The method is similar to the open-hearth process for steel making, except that specially selected pure raw materials are used. When the metal is ready to tap, pure haematite ore is added, oxidising the impurities so that they go to the slag leaving less than 0.2 p.c. in the iron. A pure ingot iron has been made in electric furnaces and very pure iron for special purposes can be made by electrolysis.

Iron. Technical name for one of a golfer's iron clubs. It is slightly shorter than the cleek, which in turn is 2 or 3 ins. shorter than the driver. The face is slightly lofted, not so much as the mashie, but more than the cleek. The iron shot from the fairway is one of the easiest of golfing shots. The player stands nearer the ball than when using a wooden club, but swings in the same manner. A powerful mid-iron is a valuable club for winter use on inland courses. See Golf.

Iron Age. Archaeological term denoting a cultural phase conditioned by the use of iron, especially for edged tools and weapons. In prehistoric Europe and W. Asia the progress of early culture is marked more or less uniformly by the successive adoption of stone, bronze, and iron. As the latest of these ages embraces the historic period to the present day, that portion which synchronised with early historic time is usually called the early Iron age.

Iron was known as a curiosity by the pyramid-builders, and a leaf-shaped spear-head from upper Egypt the earliest iron weapon known, is provisionally dated XII or XIII dynasty, at least 2000 B.C. Meteoric or magnetic ore was occasionally used for ritual purposes (early Aegean), but it was not until 1000 B.C. that iron-working became general in the Mediterranean basin. Its gradual development from bronze precursors is traceable at Hallstatt, and its fuller employment at La Tène (*q.v.*). These places give their names to the first and second periods of the early Iron age in central and W. Europe. The Tenian culture overlapped that designated in Britain late-Celtic, which passed into Romano-British

and Anglo-Saxon civilizations. (For N. Europe, where the use of iron began later, see Scandinavia.)

In all these regions cast bronze continued and developed side by side with wrought iron, the production of cast iron being virtually unknown until the Middle Ages. In N. and central Africa iron appeared in direct succession to stone. In aboriginal America, apart from the hammered imple-

ments of compact unsmelted ore of the mound-builders and others, there was no Iron age as such before its discovery by Europeans. Some peoples of low culture have had no indigenous metal age at all. See Archaeology; Bronze Age; consult Early Age of Greece, W. Ridgeway, 1901; Manuel d'Archéologie, Âge du Fer, J. Déchelette, 1914; Prehistoric England, Graham Clark, 3rd ed., 1944-45.

and rebuilt as the Crystal Palace. Two years later, wrought iron was used for the lattice girders for an exhibition building in Dublin; further examples were constructed for the Manchester fine arts exhibition of 1857. The Dublin and Manchester examples were unsatisfactory, however, and lattice girders fell into disrepute until they re-emerged as properly designed and constructed steel frameworks many years later.

The year 1856 is notable in engineering as it was then that Bessemer produced ingot iron (later known as mild steel) by conversion of blast furnace iron. At first the material was variable in quality, but the Siemens open hearth furnace process, introduced commercially at Crewe in 1868, made possible the production of a uniform and reliable metal. The ingots were rolled into various shapes, railway rails being among the first produced. Steel joists were not rolled in Great Britain until the year 1885.

In the U.S.A., the first skyscraper was erected in Chicago in 1884-85, and the transition in practice is exemplified in this building by the facts that whereas cast iron columns and wrought iron beams were used up to the sixth floor, some of the first American steel joists were used from that floor up to the tenth floor.

Fundamentally, the major structural difference between the current building and its forerunners is not in size but in the function of the walls. These are no longer load-bearing constructions, but are designed essentially for weather resistance or for internal partitioning, and they are carried at each floor level by beams which are themselves supported by columns extending down to the foundations. This has permitted considerable reductions in the weights and thicknesses of walls, with obvious economy in cost and materials. The first building of this type in Britain was begun at Stockton in 1899.

The engineering standards committee, now incorporated by royal charter as the British Standards Institution, formed in 1901, started its work with the first standardisation of structural sections in 1904; there were over 1,300 different specifications in its 1946 list. The British sections first standardised included joists from 3 ins. deep by 1½ ins. wide weighing 4 lb. per ft. (Fig. 2a) to 24 ins. by 7½ ins. weighing 100 lb. per ft. (2b). U.S.A. lists include rolled sections having

IRON AND STEEL CONSTRUCTION

W. Basil Scott, M.I.Struct.E.

The adaptation of iron and later steel to building made possible not only the skyscrapers of the U.S.A. but also the immense workshops needed for aeroplane building. Here is an account of the development of the process, and of current practice. See also Iron; Metallurgy; Steel; Welding, etc.

Isolated examples of the use of iron in building construction occurred as early as 1500 B.C. in the form of wall clamps bonding stone blocks in Babylon. General application of the metal to building in Great Britain began about 1750 when cast iron columns were substituted for timber posts in building mills. In 1801, James Watt, of steam engine fame, designed the first cast iron beams to be used in building. These beams were J-shaped, 16½ ins. deep and 14 ft. long. Their strength was approx. the same as a modern 7-in. deep mild steel joist (see Fig. 1a).

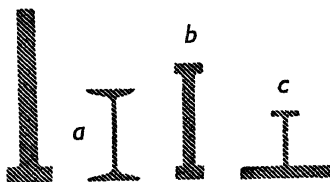
Some 20 years later, Sir William Fairbairn improved on this elementary section. His findings inspired Tredgold, who introduced the top flange in 1824 (Fig. 1b). Three years later, Hodgkinson evolved the unequally flanged section of cast iron beam which remained in general use until cast iron became obsolescent at the end of the century (Fig. 1c).

In those beams the web may be considered to resist shearing forces and the flanges as resisting the bending tendency by means of compressive forces induced in the top flange and tensile forces induced in the bottom flange. In an ordinary beam, these tensile and compressive forces are equal. The compressive strength of most cast irons varies from about 4 to about 10 times the tensile strength for the same area, and accordingly the compressive flange can be much smaller than the tensile flange; but the ratio of the areas can rarely attain the ideal value owing to other theoretical requirements, such as providing a sufficient breadth in the upper flange to prevent lateral buckling, and the practical limitations on castings which require that there should not be abrupt variations in thick-

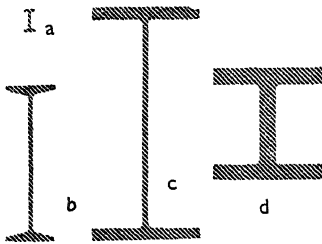
ness or long narrow projections if cracking is to be avoided during cooling.

The relatively poor tensile and impact load strength of cast iron, together with other practical limitations and the uncertainty of quality then inherent in any casting process, made cast iron an unsatisfactory material for beams. Later methods produced cast irons having tensile strengths up to 30 tons per sq. in.; but these are primarily for special purposes. The first effective substitute for cast iron was wrought iron, rolled into I-beams in France in 1849 at the instance of the French engineer, Ferdinand Zores. His beams were only 5½ ins. deep; but they introduced the rolled joist now, in mild steel, the most important element in building construction. Owing to cost, wrought iron beams never completely displaced cast iron beams; they were used chiefly for the more important members.

The fashion for exhibitions had much to do with the development of the lattice girder, the next important innovation in the history of building construction. Cast iron lattice girders used to support the galleries in the grand hall of the Hyde Park exhibition of 1851 were tested by marching soldiers over them before the public was admitted. This building was afterwards transported to Sydenham



Iron and Steel Construction. Fig. 1. a, Watt's beam and modern equivalent; b, Tredgold's beam; c, Hodgkinson's beam



Iron and Steel Construction. Fig. 2. a and b, British standard joists; c and d, American special girder and column sections

depths of up to 36 ins. (2c) and others with weights up to 426 lb. per ft. (2d). Other standardised sections are channels, angles, and tees (Fig. 3).

Where the loading is such that a simple rolled section is inadequate, then compound girders are formed by connecting plates to the flanges of rolled joists or channels, or alternatively by building a

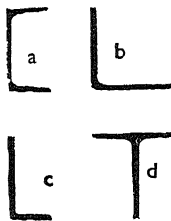


Fig. 3. a, channel; b and c, equal and unequal angles; d, tee bar

girder from an assembly of angles and plates (Fig. 4). The web plates of these angle and plate girders are almost always strengthened at bearings and at loading points by L-shaped or other stiffeners, usually disposed vertically for convenience, although inclined stiffeners have been used; horizontal stiffeners are required in very deep girders. At the other end of the scale for strength are light weight, but relatively stiff, beams assembled like lattice girders from rods or light angles. Some of these incorporate devices for attaching flooring and ceiling and are the metal equivalents of timber joisting.

Compression members are known as columns, pillars, stanchions, or struts. The first three are generally the heavier sections. In building, the main pillars are usually formed of joists with or without flange plates similar to compound girders,

or two members may be laced or battened together; while in lattice girders and in roof trusses, angles are preferred for the struts and also for the ties.

The use of welding as an alternative to rivets or bolts for uniting the component parts of the steel frame was another major development in structural engineering. Welding was adopted in Great Britain primarily as a means of eliminating the noise of riveting, but this is now recognized as the least of its merits.

The evolution of the steel frame structure necessitated new building laws and initially these varied from detailed Acts of parliament to simple by-laws. These were followed by specifications prepared by the British Standards Institution, the professional institutions and other recognized bodies, including a codes of practice committee formed under the aegis of the ministry of Works. Except in large cities having their own detailed building laws, the appropriate British standard specification is now generally accepted as a guide to the suitability of a design or of the materials used.

These developments have produced profound changes in building technique, of which the recognition and deliberate utilisation of the continuity between members is perhaps the most significant.

In older buildings, a beam rested on top of the walls in much the same manner as a tree trunk rested on opposite banks of a stream to form a primitive bridge. In neither case was the strength of the beam enhanced by the supports. Certain types of modern structure, however, have the beam more or less rigidly attached to the supporting pillars so that the one cannot bend without tending to distort the other. The resistance to distortion of the pillars is thus utilised to increase the load-bearing capacity of the beam. This is known as rigid-frame construction and is frequently associated with welding. Structures are no longer con-

sidered simply as skeletons sufficiently strong to support the imposed working loads and weather excluding surfaces; but rather as integral wholes in which steelwork and light alloys, flooring and walling materials, etc., are interdependent.

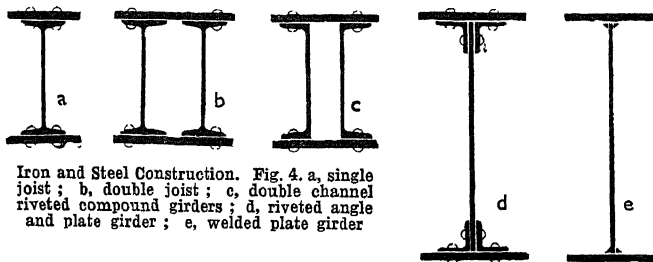
The manufacture of stronger steels permitted the engineer to design longer spans, and this in turn made possible the construction of, e.g. workshops having large areas of floor without obstructing pillars.

Some aeroplane factories have floor space 350 ft. by 400 ft. without columns yet with an overhead crane system serving the entire floor. Nor is this the limit of possibility in the size of spans.

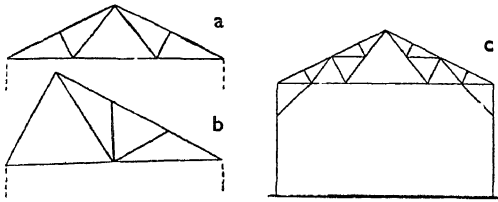
Design of rigid-frame and large span structures requires more thorough investigation by more complex methods. Theoretical data are obtained from the examination of small scale transparent models by polarised light whereby differences in stress intensity are shown as colour variations. This is associated with increased use of the actual structure as a full scale specimen for stress measurements to verify the design. Theoretical knowledge and practical experience thus develop vigorously. Yet two of the fundamental bases of current theory remain: Hooke's law relating load and deformation (announced in 1676), and Euler's column stress formula of 1774.

STRUCTURAL PRACTICE. The design of the framework starts with the roof, as the loads from this have to be supported by the various parts below it right down to the foundations. The roof may be flat or ridged or, rarely, curved. Flat roofs are generally similar to light floors; improved materials ensure watertightness. The slope of ridged roofs is governed mainly by the type of covering; an angle of about 25° is common. Types of roof truss are shown in Fig. 5. In theory, almost any type of truss can be used for any span; but in practice the type selected is usually one which limits the lengths of the individual parts of the rafter to 5-10 ft. The longitudinal spacing of trusses may be governed by the column spacing for the underlying floors; but wide variations are possible, depending on the types of purlins and covering to be used.

Where trusses are fabricated with rivets or bolts, then angles (Fig. 3, b, c) are the most popular type of section for the members, and connexions between the



Iron and Steel Construction. Fig. 4. a, single joist; b, double joist; c, double channel riveted compound girders; d, riveted angle and plate girder; e, welded plate girder



Iron and Steel Construction. Fig. 5. a, truss for short spans; b, "north-light" truss, glazing on steep slope only; c, French truss, with knee braces to supporting columns

various bars are made by attaching each bar separately to a mutual gusset plate. In welded trusses, symmetrical sections are preferred and tubes are sometimes used. The members are welded directly to each other and gusset plates are usually eliminated. (The conventional analysis of the forces in the members of a roof truss relates to frame-work having pinned joints free to rotate.)

Another type of roof, generally fabricated by welding, depends on the rigidity of its joints for its stability and thereby eliminates the cross-tie between the opposite sides at eaves level so that head-room is increased (Fig. 6). The posts and rafters in these rigid-frame roofs are frequently of joist section.

The next stage in the design is the floors. These may be of timber or of slabs, the two main types of which, though having different characteristics, are adaptable to almost any uses if suitably finished and treated. In one type, the strength is provided by light gauge pressed metal troughs to which heat and sound insulating materials suitable to the particular conditions can be added. The other type is frequently of concrete of adequate section to provide strength and having certain inherent heat and sound insulation properties due to its weight and composition. A special wearing surface is usually added to each type.

The economic span for most floors is generally considerably less than the desired spacing of columns, and so the floor is supported at suitable intervals by floor beams framing into larger beams which can be connected to the columns or to a further intermediate beam network.

deflection is limited to about one in. for spans of 25-30 ft. The strength of a steel beam depends primarily on its depth and on the

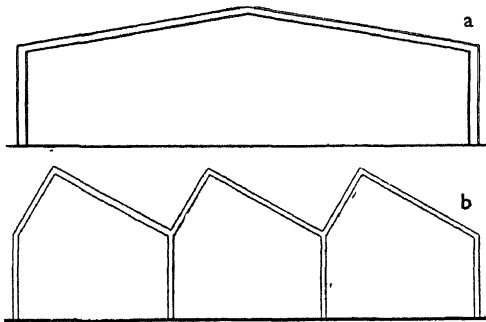


Fig. 6. a, single-span symmetrical rigid frame roof; b, multi-span "north-light" rigid frame roof

area of its flanges. These are measured by a composite term called the modulus of section which is a purely geometric function of the beam shape and takes no account of the special properties of the metal. A peculiar characteristic of a steel beam is its ability in certain circumstances to bring into operation safely a reserve of strength by diverting stress from critical points to places less fully stressed. Various methods are adopted to utilise this reserve.

The columns are placed normally at the inter-sections of the main beam system, and as they are obstructions to the floor they must be strictly limited in number and size. In calculating the strength of a column, allowance must be made for the effects of its length, variations in the restraint of the end connexions, deviations from straightness of the member itself, and also for any eccentric application of the loading. These considerations make formulae for column design very involved, and the engineer usually assumes a section and then checks its adequacy, instead of calculating the required

Not only must the beam used be strong enough to support the floor loads, walls, and partitions, they must also perform this task without much deflection or sagging. For ordinary purposes, the

properties and then selecting the suitable section, as for a beam.

To facilitate fabrication and erection, columns are frequently pre-constructed in two-storey lengths, and then superimposed lengths are united at the site by splice plates. Seating angles for the beams are attached in the workshop, and the lower length is provided with a suitable base to distribute the load to the foundation.

The beams and columns of riveted or bolted structures are usually connected together by short lengths of angle section, called cleats (Fig. 7). These are provided with sufficient rivets or bolts to transmit the applied loads and to retain the various members in their proper position and alignment. In welded structures, temporary cleats are often bolted to the various members to hold them in position conveniently until the strength welding is completed. The engineer may select the connexions to be practically rigid or else to have a limited degree of flexibility in a desired plane. Particularly where partially flexible types of connexions are used between beams and columns, it may be necessary to give the entire framework additional stiffness to resist wind and other horizontal

loadings. This is often done by diagonal bracing in selected bays so that the frame acts like a vertical lattice girder.

Although most structures are specially designed for a particular purpose, yet certain

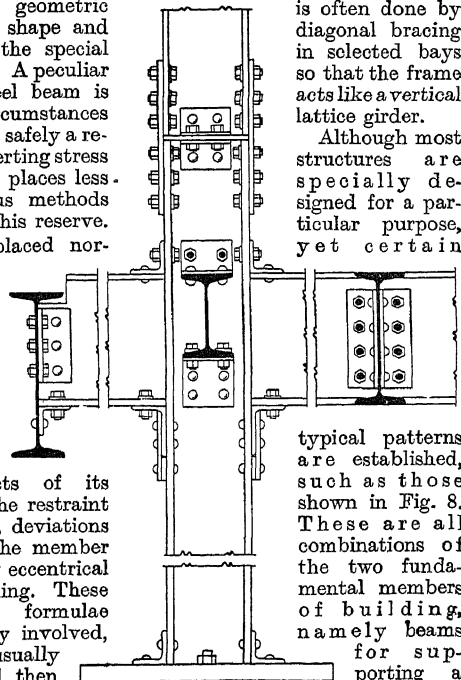
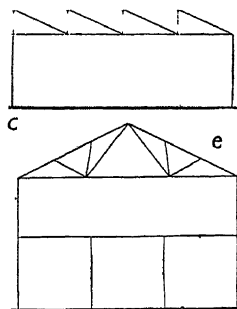
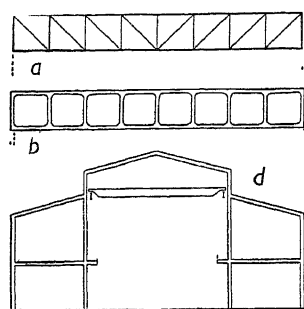


Fig. 7. Details of beam and column connexions

typical patterns are established, such as those shown in Fig. 8. These are all combinations of the two fundamental members of building, namely beams for supporting a load over an opening,



Iron and Steel Construction. Fig. 8. a, lattice girder; b, rigid joint girder; c, saw-tooth roof glazed on vertical faces; d, workshop with overhead travelling crane; e, two-storey workshop; f, multi-storey building with basements

and columns for carrying a load down to a foundation. Success results not so much from mathematical skill in evaluating the loads and stresses or mechanical dexterity in assembling the parts as from the engineer's sense of proportion and suitability of the various metals and other materials that he uses to carry the loads and make the building convenient for its job and economic for its intended life.

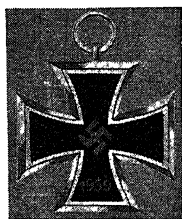
Iron and Steel Institute. THE. British association founded in 1869 to afford a means of communication between members of the iron and steel industries, and to arrange periodical meetings to discuss practical and scientific subjects bearing on the manufacture of iron and steel. It was incorporated by royal charter in 1899 and now numbers over 4,000 members. It awards annually a gold medal first presented by Sir Henry Bessemer. In 1901 Andrew Carnegie founded the research fund and medal known by his name. The Williams prize is awarded annually for the best paper of a practical character. The institute maintains jointly with the Institute of Metals a valuable technical library at its headquarters, 4, Grosvenor Gardens, London, S.W.1.

Iron-bark Tree (*Sideroxylum dulcificum*). Tree of the family Sapotaceae, native of W. Africa. It has leathery, alternate leaves, and small, whitish flowers in clusters. Its fruit is an oval berry, known as miraculous-berry, its intense sweetness clinging to the palate and nullifying the acidity of any other food taken shortly after. The timber is very hard. The name iron-bark is also applied in Australia to *Eucalyptus resinifera* and *E. siderophloia*, and, with a qualifying adjective, to several other species of *Eucalyptus*. See Gum.

Ironbridge. Small town in Shropshire, England. It is on the Severn, near Coalbrookdale, and with Broseley shares a railway station, 13 m. S.E. of Shrewsbury. It was named from the first large iron bridge in England, put up here across the river in 1779. See Bridge illus.

Ironclad. Name given to the first armoured warships. The earliest British ironclads were the Warrior, completed at Blackwall in 1860, and the Black Prince, completed at Glasgow in 1861. Both were of 9,210 tons displacement, and carried nothing heavier than an 8-inch muzzle-loading gun. In time wrought-iron armour as a protection for warships gave way to specially hardened steel plates, which, though thinner, had much greater resisting power.

Iron Cross. German military order. It was instituted in 1813 by Frederick William III as an



Iron Cross, German military order

award for bravery in battle during the war of liberation, and comprised two classes, together with a special grand cross. The last-named was awarded only 19 times, the first recipient being Marshal Blucher, 1815, and the last F.M. von Hindenburg, 1918. The cross of the first and second classes consisted of an iron Maltese cross edged with silver with the royal cipher in the centre, a crown in the upper limb and the year of the award in the lower. Some 3,000,000 of the second class were awarded in the First Great War.

On Sept. 2, 1939, Hitler reinstated the iron cross for award in the Second Great War. The shape of the cross remained the

same, but it bore a swastika in the centre and the date 1939 on the lower limb. The order was divided into five classes, awards in all classes being made with extreme liberality.

Iron Crown. Crown of jewelled gold incorporating a thin circlet of iron, said to have been beaten out of a nail used in the Crucifixion. It was made for Agilulf, king of the Lombards, 591, by order of his queen Theodelinda, who afterwards committed it to the perpetual custody of the church at Monza, near Milan. Charlemagne was crowned with it, as were all the subsequent emperors who were also kings of Lombardy. Napoleon crowned himself with it at Milan in 1805, and in 1859 the Austrians removed it to Mantua. They restored it in 1866, when it was presented to Victor Emmanuel at Turin. See Lombards.

Iron Curtain. Term popularly applied to the political and economic barriers which after the Second Great War separated Soviet-controlled E. Europe from the Western democracies. The phrase was first used by Winston Churchill in the course of a speech at Westminster College, Fulton, Missouri, March 5, 1946.

Iron Duke. A former British battleship. Completed in 1914, she displaced 25,000 tons on a length of 622 ft. and a beam of 90 ft. She was the flagship of Earl Jellicoe while in command of the Grand Fleet, 1914-16, and at Jutland registered hits on the German battle cruiser König. In 1919 she became flagship of the Mediterranean fleet and was in action against the Bolsheviks in the Crimea. Prince George, later duke of Kent, served in her as a midshipman. By the London naval treaty of 1931-32 the Iron Duke was demilitarised and became a gunnery training ship. On Oct. 17, 1939, she was attacked

by German aircraft in Scapa Flow and sank in shallow water. She was reconditioned as a fleet accommodation ship, and after the Second Great War she was sold as scrap.

Iron Gates. Name given to the narrowing of the Danube between Orsova and Turnu Severin in S.W. Rumania. It is about 2 m. long, and here are the great rapids beside an island in midstream, due to the Danube cutting through the mountain range called in the N. the Transylvanian Alps, and in the S. the Balkans. Between 1890 and 1900 a navigable way was made by blasting, over a million cubic yds. of rock being removed. Both the main road and rly. follow the left bank from the Banat to the Wallachian plain. See Danube.

Iron Guard. Fascist organization of Rumania. It was modelled on and inspired by the Nazi system, and Codreanu, its leader, was a violent anti-Semite. In the autumn of 1938 King Carol assumed dictatorial powers, and Codreanu, with a number of other leaders, was shot. After the collapse of France in June, 1940, members of the organization helped to form a new Rumanian government. On Sept. 4 Gen. Antonescu became premier, and the Iron Guard agitated for the abdication of Carol, which took place two days later. On Nov. 27 the society instituted a massacre of its opponents; but owing to internal quarrels Antonescu disbanded its police. The organization then broke into two factions. A decree of Nov., 1944, provided for the arrest of all former members of the Iron Guard.

Iron Lung. Device for applying artificial respiration when the chest muscles are too weakened by disease, as in infantile paralysis, to induce natural inhalation and exhalation. The patient is placed in a metal cylinder with the head protruding through an airtight rubber collar. By an electrically-driven compressor, air pressure inside the cylinder is changed to create an alternate partial vacuum

and pressure; this, acting on the body of the patient, causes the chest to expand and contract as in normal breathing. The number of respirations can be adjusted, varying from 15 to 35 per minute, and the usual pressure is equivalent to 4 oz. per sq. in. The first practical iron lung was constructed in 1935 by Dr. Philip Drinker, lecturer in physiology at Harvard medical school. In some hospitals, notably in the U.S.A., whole wards are built on the principle of the iron lung, the bodies of the patients



Iron Lung. Child sufferer from infantile paralysis inside an iron lung at the Isolation Hospital, Scunthorpe, Lincs

being inside the pressurised room and their heads outside.

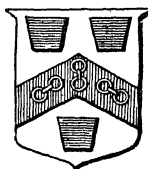
Iron Mask, THE MAN IN THE. A French state prisoner. The radical facts in this famous historical enigma are three. On Sept. 18, 1698, Saint Mars, a trusted officer of Louis XIV, brought to the Bastille in a litter a male prisoner, whose face was hidden by a mask. Five years later, Nov. 19, 1703, the prisoner died in the Bastille. At dusk next afternoon he was buried in the churchyard of S. Paul, just outside the prison. The official entries of his reception in the Bastille, his death and interment, the sole incontestable documents in the case, are extant. This is the brief story of the masked man whose identity has intrigued the world. The mask, described sometimes as of iron, seems actually to have been of black velvet.

Voltaire bewitched his generation with a legend, afterwards wonderfully embellished by Dumas in *Le Vicomte de Bragelonne*, that the unknown prisoner was an

illegitimate son of Anne of Austria, a brother, therefore, of Louis XIV himself. Other hypotheses have been advanced, setting up claims for Vermandois, Buckingham, Monmouth, the duc de Beaufort, Fouquet, a son of Cromwell, a son of Charles II, even Molière. In *L'Homme au Masque de Fer*, 1870, Marius Topin, in succession to Heiss, Roux-Fazillac, and Delort, pronounced definitely for Count Ercole Mattioli, secretary of state to the duke of Mantua. Mantua's revenues being usually pledged to the Jews, Louis XIV conceived the notion of buying from him for hard cash the fortified town of Casale, on the high road to Milan. Negotiations lay with Mattioli, who for a double bribe betrayed both his master and Louis XIV. The king, furious, had him kidnapped, May 2, 1679. Mattioli was carried to the fortress of Pignerol, and here in the Île Sainte Marguerite and in the Bastille successively he was for 24 years in captivity.

In 1898 Funck-Brentano, in *Légendes et Archives de la Bastille*, clinched it by printing facsimiles of the two Bastille records. These taken together show inferentially that Mattioli was the masked prisoner in Saint Mars' keeping. Certainly no other name of a claimant to the mask is within measure of satisfying the demands of the two essential documents. For the employment of the mask there seems no royal warrant, and Funck-Brentano suggests that its voluntary adoption by the prisoner himself would afford relief to him in his captivity. Before his death Mattioli had apparently dropped out of account among the inmates of the Bastille, and shared a room with others, forgotten by the sovereign whose vengeance had exhausted itself. Lord Acton, the historian, declared that Mattioli was the man in the iron mask.

Ironmongers' Company. The tenth of the twelve chief London city livery companies. Formed c.



Ironmongers' Company arms

1800, its arms were granted in 1435, by laws framed in 1455, and the first of its six charters granted in 1464. The name of Ironmonger Lane, S. from Gresham Street to Cheapside, commemorates the part of the city in which the craft

centred before moving to Thames Street. The first hall was in Fenchurch Street, E.C., the site of which was acquired in 1457; it was rebuilt in 1587 and in 1748-52. Escaping serious damage by the fire of 1666, it was used for service in 1673 by the parishioners of All Hallows, Staining; and the Turkey Company held meetings here in the 18th century. The interior was remodelled in 1847. In 1917 the hall was destroyed by German aircraft. The new hall in Aldersgate St. was put up in 1922-25 on the site of an Inigo Jones residence known as Thanet House, later as Shaftesbury House. It was damaged in the Second Great War.

Ironmould. Name given to the red stains resulting from the contact of iron, in soluble form, with linen or cotton fabrics. Ink, a solution of iron tannate or gallate, is one of the chief causes of ironmould on linen, the iron being converted into ferric oxide in the process of washing the fabric. Oxalic acid or an acid oxalate, such as the so-called salts of lemon, removes the stains by combining with the ferric oxide to form an iron salt soluble in water.

Iron Mountain. City of Michigan, U.S.A., and co. seat of Dickinson co. On the Upper Peninsula, near the boundary with Wisconsin, it is served by rlys. and is a trading centre of the Menominee Range area. Iron ore was mined from 1878, when rich deposits of haematite were discovered, until the 1930s. In the suburb of Kingsford, the Ford Motor company maintains extensive plant, including the world's largest establishment of drying kilns. Iron Mountain was chartered 1887. Pop. 11,080.

Iron Ores. Of the many iron-bearing minerals, only four are important ore minerals. These are magnetite (72 p.c. iron); haematite (70 p.c.); limonite and goethite, hydrated yellow-brown oxides (60 p.c.); and siderite, sometimes known as chalybite or spathic iron ore (48 p.c.). Some siderite ores contain greenish hydrous iron silicates, chamosite and greenalite, e.g. in the Midlands and in parts of France. These ores never contain the theoretical percentages of iron given above. Quartz, clay, limestone, manganese, titanium, sulphur, phosphorus, and arsenic are common impurities; manganese and titanium may be desirable constituents, but the last three must be removed.

The huge magnetite deposits at Kiruna and Gellivare, Sweden, are

the most famous of their kind. An enormous sheet of magnetite outcrops on the crest of a hill and is worked by quarrying; the estimated ore reserve is over 1,000 million tons. It probably originated as a result of magmatic differentiation in depth. It could not be worked until the Thomas process eliminated the phosphorus content. Sometimes sedimentary ores have been converted into magnetite by metamorphic processes.

Haematite ore bodies occur in Cumberland, around Lake Superior, at Krivoi Rog (Ukraine), and Bilbao (Spain). The former are considered to be replacements of limestone by haematite derived from overlying ferruginous sediments. The Lake Superior deposits may have a sedimentary origin. The hydrated oxide ore bodies are generally formed by sedimentary processes. Large deposits occur in Alsace-Lorraine, where the ore is oolitic.

Among siderite (iron carbonate) ores, impure nodules and bands in the Coal Measures are known as clay-ironstone and blackband ironstone. Jurassic oolitic iron ores stretch from Yorkshire to Northants. Similar deposits occur in Newfoundland.

Ironside, WILLIAM EDMUND IRONSIDE, 1ST BARON (b. 1880). British soldier, born May 6, 1880,

son of Surg.-Maj. William Ironside, Aberdeenshire, educated at Tonbridge and the R.M.A., Woolwich, he entered the Royal Artillery in 1899.

In the First Great War he was mostly a staff officer, commanded Allied troops at Archangel, 1918-19, and was knighted. Promoted major-general, he was commandant of the staff college, Camberley, 1922-26; Q.M.G. in India, 1933-36; then G.O.C.-in-C. Eastern Command. At the outbreak of the Second Great War, Ironside was c.-in-c. Gibraltar, but returned to the U.K. to be chief of the imperial general staff. From May to July, 1940, he was commanding home forces. The small bodies of mobile and strongly armed troops organized at that time for local defence were named Ironsides after him and in allusion to Cromwell's soldiers. Promoted field marshal, he was made a peer in 1941.



Lord Ironside,
British soldier

Ironsides. Name given to the troopers of Oliver Cromwell. Rupert is said to have described Cromwell himself as an Ironside, possibly with sarcastic reference to his body armour, and about 1648 the term was applied to Cromwell's troopers in recognition of their excellent discipline. Earlier, Edmund, the rival of Canute, had been surnamed Ironside.

Ironstone. The name given in Australia to the iron-rich oxidised outcrop of certain mineral veins. See Gossan.

Ironwood. General term applied to a large number of distinct trees whose timber is hard and heavy. Almost every country has an ironwood tree, but in each the name is applied to a species distinct botanically, and even in one country it may indicate several different species, e.g. in New South Wales, where ironwood indicates *Olea paniculata*, *Parrietha argyrodendron*, or *T. actinophylla* indifferently.

Ironwood. City of Michigan, U.S.A., in Gogebic co. On the Upper Peninsula, on the Montreal river, opposite Hurley, Wis., it is served by the Chicago and N.W. rly. It has iron ore mining and lumbering enterprises; over 100,000,000 tons of high-grade ore have been shipped from the district in 50 years. Bessemer steel is also made. Ironwood was settled in 1885 and chartered as a city in 1889. Pop. 13,369.

Irony (Gr. *εἰρωνεία*, dissimulation). In rhetoric a method of speech by which the words used convey a meaning the reverse of that which is really intended. It is a form of ridicule exposing errors or faults by seeming to adopt or approve them, and, employed by a master, is a deadly weapon. Pascal's Provincial Letters is an admirable example of delicate irony. Swift was a master of savage irony. Socratic irony is the method of teaching adopted by Socrates. He pretended ignorance, seeming to solicit information, and then suddenly confronted his opponent with some unexpected consequence deduced by the string of questions. Tragic irony is the name given to a device used in Greek tragedy, notably by Sophocles, whereby a character's words and action are wholly contradictory to the actual situation as known to the audience.

Iroquois. Confederacy of North American Indian tribes, once occupying part of New York state. During the 16th century the Mohawks, Cayugas, Oneidas,



Iroquois. Left, chief, Quebec Province. Right, squaw

Onondagas, and Senecas formed the so-called Five Nations; the incorporation (1715) of the Tuscaroras resulted in the Six Nations group. Perhaps of ultimate Algonquian derivation, they spoke dialects of the Iroquoian family, which originated along the St. Lawrence river, and included Cherokees and Hurons. They attained the highest Amerind social organization, with chiefs and sub-chiefs, chosen in tribal councils dominated by the matriarchy. Maize culture was their staple industry; the chase was secondary. In Canada they number now a few thousands; in the U.S.A. perhaps 50,000, including Cherokees. *Pron.* Iro-kwoy. *See* American Indians.

Irradiation. A term used in physics as applied to medicine. Treatment of disease by subjecting the patient to some form of radiation received a great impetus with the increasing knowledge of nuclear physics. The object of all radiation therapy is to produce such powerful effects upon groups of cells that they are either killed outright or prevented from further development. The main problem involved is to measure the biological reaction of the tissues to the intensity and quality of the radiation, quality being measured by the distribution of the ions produced in the material irradiated, a phenomenon that can be illustrated by the effect of X-rays on matter. If high voltage X-rays are used, the secondary electrons produced in the material have long ranges, so that the ionisation will be dense towards the ends of their tracks; on the other hand the secondary electrons from low voltage X-rays have short ranges, and the ionisation is uniformly dense along these short tracks.

Two other main sources of radiation used in therapy are

radium and neutron bombardment. The energy released in radio-active transformations is emitted as radiation in the form of alpha (α), beta (β), and gamma (γ) rays. Alpha rays (i.e. helium nuclei) have only a small penetration power and therefore are of little therapeutic value. Beta rays are electrons with speeds varying from approx. one-sixth of that of light to nearly that of light. The fastest β rays have a greater penetrating power than α rays but only sufficient to be useful in the treatment of superficial lesions. Gamma rays derived from radium, however, cover a wide range of penetrating power and the hardest type can pass through 6 ins. of lead, and possess a wavelength much shorter than that of the hardest X-rays. Since the γ rays in their interaction with matter give rise to a secondary corpuscular radiation of high speed electrons which act biologically on the tissues, they provide a means of conveying energy to deep-seated parts of the subject.

In neutron bombardment, the protons (i.e. hydrogen nuclei) and α particles produced give rise to ionisation and consequent biological effects. The quality of the radiation is therefore quite different from that of X-rays, and suggested its use in dealing with certain cancer cells resistant to radiation by X-rays. Initial experiments proved encouraging.

IRRADIATION IN OPTICS. Owing to its imperfection as an optical instrument, the eye registers the image of a luminous point on the retina as a circle. Consequently the numerous luminous points on the outline of a bright object seen against a dark background overlap into the background, making the bright object appear larger than it actually is. This illusion is termed irradiation.

IRRADIATION OF FOODSTUFFS. Enrichment of food by direct or indirect irradiation has been practised since 1920. The most usual procedure is to add calciferol (synthetic vitamin D), produced by irradiation of ergosterol made from yeast, and this is done with margarine and many infant foods. The corresponding product from 7-dehydrocholesterol is frequently added to chicken food.

Irrational Numbers. Numbers which cannot be expressed as the quotient of two integers. Such a number is the square root of 2, which cannot be obtained exactly as a whole number and a fraction,

i.e. as the quotient of two whole numbers. An important irrational number is π , the ratio of the circumference to the diameter of a circle. *See* Surds.

Irrawaddy. A variant spelling of the river of S.E. Asia, also spelled Irawadi (*q.v.*).

Irredentism. Movement in Italy aiming at the deliverance of all Italian-speaking lands from foreign rule. Its rallying cry was *Italia irredenta*—Italy unredeemed—and it came into existence after the formation of the kingdom of Italy, 1861. Its chief demands were for the cession by Austria-Hungary of the Trentino, Trieste, and other Italian-speaking areas remaining under her rule; but the movement also sought to secure Malta from Great Britain, Corsica and Nice (Nizza) from France. The movement lost much of its strength after the conclusion of the triple alliance, 1882. Many of the irredentist demands were conceded by the treaty of St. Germain, 1919, which even gave Italy German-speaking areas of the Tirol. Irredentist feeling was reanimated by the fascist regime, with its renewed demand for Nice and Corsica; and the continuing Italo-Yugoslav frontier antagonism kept it alive after the Second Great War.

Irregulars. Troops raised in war for temporary service in particular localities on special terms. Such were the Croats who served under General Loudon in the Seven Years' War; the *franc-tireurs* in the Franco-Prussian War; T. E. Lawrence's Arabs who drove the Turks from the Hejaz and Transjordan in 1917-18; the Ethiopian patriot troops organized by the British in 1940-41; and the French resistance and other European underground movements of the Second Great War. *See also* Guerrilla; Maquis; Resistance Movement.

Irrigation (Lat. *irrigare*, to water). A method of supplying water to land in order to increase its productivity. In India and the U.S.A. vast areas of land, hitherto worthless, have been put to useful account, while Egypt depends almost entirely upon irrigation.

Water for irrigation purposes is obtained either from rivers or wells. As the normal level of a river is below that of the lands to be irrigated, it is usual to construct a barrage or weir across the bed and raise the level of the river sufficiently to direct part of its flow into canals having intakes above the weir. Surplus flood water

passes over the crest of the structure or through sluices. Automatic shutters and gates keep the level approximately constant.

To make fuller use of a river, the annual discharge must be regulated by a dam built in an appropriate location. In the flood season immense quantities of water are impounded behind the dam for consumption during periods of smaller natural flow. The most important irrigation schemes of the U.S.A., India, and Australia are based upon the formation of huge reservoirs, and the irrigation of the Nile valley has been greatly extended by the controlling influence of the large dam at Assuan.

The simplest form of irrigation is inundation, which occurs naturally on the banks of the Nile, and may be produced artificially if a river is headed up by a temporary obstruction. The land is divided into sections by low banks which trap the water. As the level of the river falls, the water drains away, leaving behind a deposit of fertilising silt. Where perennial irrigation is required an elaborate system of main canals, subsidiary canals, feeders, and ditches, successively multiplying in number while decreasing in size, becomes necessary. In a gravity scheme the main canals follow a contour along the upper edge of the district to be irrigated, and at intervals throw off branches which subdivide the area and feed a number of main ditches. These ditches deliver to distributaries running down the slope through the fields, and the distributaries in turn supply minor ditches or basins laid out across the slope. The method of application varies with the character of the crop. Fodder crops are watered by allowing the liquid to flow over the ground in a thin sheet, whereas root crops and orchards are better served by admitting water to furrows between the rows until the intervening earth is saturated. In the Carolinas many plantations are irrigated by a system of underground tile flues. When these are stopped up at the lower end the water is forced up through the earth as needed, and any surplus drains away when the plugs are withdrawn.

Rice requires to stand in water during the period of growth. Other crops are damaged by overwatering, so, especially where water is scarce, the irrigator uses the minimum needed. To prevent waste, the supply canals and ditches are in some districts not made self-discharging, and the irrigator has

to raise what water he requires to a level from which it will flow over his land. Most irrigation schemes are maintained by the taxation of land supplied, the charge per unit of area varying with the nature and profitability of the crop.

Irritability (Lat. *irritare*, to cause to snarl). In physiology, this denotes sensitiveness to stimuli or external influences as shown by alterations or movements in the living tissues. This tendency is strikingly exhibited by several plants. Thus, the stamens of the barberry and of kalmia, when touched by an insect, rise up with a jerk and strike it, dusting the disturber with pollen.

The bilobed stigma of mimulus, *martynia*, *goldfussia*, etc., on being touched close their lobes face to face. The irritability of the sensitive plant (*Mimosa pudica*) has long been known. A slight concussion causes all the leaf-stalks to bend down, while the leaflets turn forwards and upwards and fold up.

In some plants the seed vessel is very irritable. If a seeding plant of *Cardamine impatiens* be touched, a volley of seeds strikes the face of the disturber. Much the same happens if the seed vessel of the wood-sorrel (*Oxalis*) be touched.

Irthing. River of N. England. Rising among the hills on the Northumberland and Cumberland borders, it flows for several miles between these counties, and then S.W. through Cumberland to the Eden, which it joins near Warwick, 4 m. E. of Carlisle, after a course of 30 m. The lower valley forms the western end of the Tyne Gap across the Pennines.

Irtysh. A river in Soviet Central Asia. It rises in the Chinese Altai, flows N.W. through Lake Saisan, crosses the N.E. of Kazakh S.S.R., and falls into the Ob at Samarovsk after a course of 2,300 m. When free from ice the river is a valuable means of communication, and two branch rlys. terminate on its upper course. The chief towns on its banks are Tobolsk, Omsk, and Sempalatinsk. Above Tobolsk formerly stood Sibir, the capital of a Tartar khanate, captured by the Cossack Yermak (16th century). This gave its name to the whole country.

Irula (Tamil, dark). Primitive tribe in Madras prov., S. India. Numbering about 100,000, mostly in the E. districts, where they have become Hinduised, their aboriginal characters are best preserved in the Nilgiri hills. Blackish-brown and broad-nosed,

5 ft. 3 ins. in height, speaking a Tamil dialect, they are jungle-dwelling animists, living on roots and honey, and practising ear-distension. Many now labour on coffee plantations. They worship Rangaswami, a form of Vishnu.

Irún. Town of Spain, in the province of Guipúzcoa. Standing on the Bidassoa, 10 m. by rly. E. of San Sebastian, and 1 m. W. of Hendaye in France, it is the chief custom house for Spanish-Continental overland trade. It is a rly. junction, and has ironworks and paper mills. There are an old church and a handsome town hall, and nearby are thermal springs. Irún was one of the first towns to fall to Gen. Franco's forces in the Spanish Civil War, Aug., 1936. Pop. 14,160.

Irvine. Royal and mun. burgh and seaport of Ayrshire, Scotland. It stands on the Irvine, 30 m. S.W. of Glasgow on the railway. Steps were taken about 1870 to clear the harbour, and it has now a considerable trade. The parish church was rebuilt in 1774. Irvine was made a burgh in the 13th century. Burns lived here for some time. Market day, Mon. Pop. 15,000. The river Irvine, 30 m. long, rises near Drumclog, on the Lanarkshire border, and enters the sea at Irvine.

Irvine, ANDREW C. (1902-24). A British mountaineer. Youngest member of the Mt. Everest expedition of 1924, he was chosen by George Mallory to accompany him on the second and final attempt to reach the summit, June 8, 1924. Both perished in the exceptionally courageous attempt, and it is uncertain whether the summit was reached. See Everest.

Irving, EDWARD (1792-1834). Scottish divine. Born at Annan, Aug. 4, 1792, and educated at Edinburgh university, he became a schoolmaster at Haddington, where Jane Welsh, afterwards Mrs. Carlyle, was one of his pupils. He and Carlyle were rival schoolmasters at Kirkcaldy. He was licensed to preach in 1815, and in 1819 was assistant to Chalmers at S. John's, Glasgow. In 1822 he became chaplain at the Caledonian Asylum's chapel in Hutton Garden, London. His congregation removed to a new building in Regent Square in 1824. In 1832, charged with heresy, he left them and associated himself with the Catholic Apostolic Church. An appeal against his dismissal failing in 1833, his health gave way, and he died of consumption, Dec. 7, 1834. Irving wrote and preached

mainly on the prophecies, the imminent Second Advent, and the Incarnation. Carlyle paid several noteworthy tributes to his memory. *Consult Works*, ed. G. Carlyle, 1864-65; *Life*, M. O. W. Oliphant, 3rd ed. 1865.

Irving, SIR HENRY (1838-1905). British actor-manager. Son of a small shopkeeper of yeoman



Henry Irving

stock, John Henry Brodribb, to give him his original name, was born at Keinton Mandeville, Somerset, Feb. 6, 1838, and attended Dr. Pinches's school in Lombard Street, London. At 14 he became a clerk to East India merchants. Four years later he was engaged for the stock company at the Lyceum, Sunderland. He played for two years under R. H. Wyndham at Edinburgh; then in 1860 joined Charles Calvert at Manchester, where, at the Theatre Royal and the new Prince's Theatre, he remained nearly five years. The part that brought him to London was Rawdon Scudamore, the villain in Boucicault's *Hunted Down* (St. James's, 1866).

From Dec., 1867, until March, 1869, Irving was at the new Queen's Theatre, where he first met Ellen Terry, appearing as Petruchio to her Katharina. Leading man at the Lyceum as Mathias in *The Bells*, an English version of Erckmann-Chatrian's *Le Juif Polonais*, produced Nov. 25, 1871, he at length achieved fame. He added steadily to his reputation by performances as Hamlet, Macbeth, and Richard the Third.

On Dec. 30, 1878, Irving began his own management of the Lyceum, playing Hamlet to the Ophelia of Ellen Terry, who thus began a famous connexion of 24 years with him. Next year they first acted as Shylock and Portia.

Irving remained at the Lyceum, producing Shakespearian plays, staging poetical and romantic dramas, but putting on no work from a representative modern British dramatist. His greatest popular and financial success was won in Wills's version of Goethe's *Faust*, 1885; his greatest artistic triumph in Tennyson's *Becket*, 1893. His final appearances at the Lyceum, 1902, were in *Faust* and in *The Merchant of Venice*. At Drury Lane, April 29, 1905, he revived *Becket* and was received with tumultuous applause. He went on tour with the piece, but on Oct. 13 collapsed on reaching his hotel at Bradford, and died. His cremated remains were buried in Westminster Abbey, Oct. 20.

Irving married in 1869 Florence, daughter of Daniel O'Callaghan, surgeon-general in the East India Company's service, by whom he had two sons, each noted below. Irving was knighted in 1895, the first actor so honoured.

Though he essayed most of the greater Shakespearian rôles, and within the limits of his personality had a wider range than any English-speaking actor of his period; though, too, his features possessed a beauty and a refinement which were accentuated by the passage of years, Irving had neither the physical nor the temperamental equipment of the great tragic actor. In characters of pure tragedy, like *Romeo*, *Othello*, and *King Lear* he failed completely. His most effective Shakespearian rôles, in fact, were *Benedick*, *Malvolio*, and *Shylock*, tragi-comic parts in which he had to speak prose and could indulge his morbid and rather saturnine humour. As villain, expressing brutality, malignity, contempt, fear, and horror, he was in his element; witness his *Dubosc*, *Peter the Great*,

Richard the Third, *Macbeth*, *Robespierre*, *Mathias*, and *Louis XI*; while in almost static characters of pure pathos and significant silences, of a desperate dignity and nobility, such as *Becket*, *Wolsey*, *Charles the First*, *Dr. Primrose*, he had no equal.

Bibliography. H. I., Actor and Manager, W. Archer, 1883; *Playhouse Impressions*, A. B. Walkley, 1892; H. I.: a record of 20 years at the Lyceum, P. H. Fitzgerald, 1893; *Personal Reminiscences of H. I.*, Bram Stoker, 2 vols., 1906; *Life*, A. Brereton, 2 vols., 1908; *The Story of my Life*, Ellen Terry, 1908; *Life*, G. Craig, 1930; *We Saw Him Act*, ed. H. A. Saintsbury and C. Palmer, 1939.

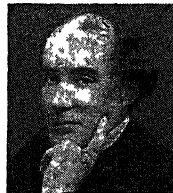
Irving, HENRY BRODRIBB (1870-1919). British actor. Elder son of Sir Henry, he was born in London,



H. B. Irving,
British actor
Elliott & Fry

Aug. 5, 1870, and educated at Marlborough and New College, Oxford. He became a member of Comyns Carr's company at the Comedy in 1894, and was with George Alexander, 1896-1900. His later successes included the title rôle in *The Admirable Crichton* at the Duke of York's, 1902, and *Hamlet* at the Adelphi, 1904. He visited the U.S.A. in 1906, was manager of the Shaftesbury in 1908, and lessee of the Savoy from 1913. A student of criminology, he wrote a *Life of Lord Jeffreys*, 1898; *French Criminals of the 19th Century*, 1901; *The Trial of Mrs. Maybrick*, 1913. His wife was Dorothea Baird. He died Oct. 17, 1919.

Irving, LAURENCE SYDNEY BRODRIBB (1871-1914). British actor. Second son of Sir Henry, he supported his father in many plays, and wrote for him *Peter the Great*, Lyceum, 1898. He first made his mark as Hjalmar Ekdal in Ibsen's *Wild Duck*, Royalty, 1894. His best impersonations were his anarchist student in *The Unwritten Law*; his tyrannical father in *The Lily*; and his Japanese patriot in *Typhoon*, 1913. He and his wife, Mabel Hackney, were drowned when the Empress of Ireland foundered, May 29, 1914.



Laurence Irving,
British actor
Langley



Henry Irving as Mathias in *The Bells*, a Lyceum melodrama

Irving, WASHINGTON (1783-1859). American author. He was born in New York, April 3, 1783, of Anglo-Scottish parentage, and owing to delicate health in childhood had a fragmentary education, spending much time exploring the Hudson and the Catskills.



Washington Irving,
American author

In 1802 he contributed to his elder brother's paper, *The Morning Chronicle*, a series of letters signed Jonathan Oldstyle, in the manner of Addison and Steele. During 1804-06 he was in Europe in quest of health. In 1809 he issued his first book, *Diedrich Knickerbocker's History of New York*, a good-humoured burlesque of the old Dutch settlers of New Amsterdam, Manhattan Island.

He served as military secretary to the governor of New York during the war of 1812, and was in Europe, 1815-22, when he visited Scott at Abbotsford. In 1819-20 appeared *The Sketch-Book of Geoffrey Crayon, Gent.*, which, in addition to sketches of English life, contained *The Legend of Sleepy Hollow* and *Rip Van Winkle*. *Bracebridge Hall*, a further study of English life, followed in 1822, and *The Tales of a Traveller* in 1824.

A visit to Madrid in 1826 awakened Irving's interest in the romantic past of Spain. *The Life and Voyages of Columbus*, *Chronicle of the Conquest of Granada*, *Voyages and Discoveries of the Companions of Columbus*, and *The Alhambra* appeared during 1828-32, while for part of this period he was secretary of the U.S. legation in London. Returning to America in 1832, he wrote his *Tour on the Prairies*, *Abbotsford*, and *Newstead Abbey*, and *Legends of the Conquest of Spain*, 1835. During 1843-46 he was minister to Spain. *A Life of Goldsmith* was issued in 1849; *Mahomet and His Successors*, 1850; *Life of Washington*, 1855-59. Irving died at Sunnyside, near Tarrytown, N.Y., Nov. 28, 1859, his burial place overlooking Sleepy Hollow.

Irving's work, fresh, original, whimsically humorous, gently ironical, was concerned with the romantic past. He helped to develop the essay and short story, and the spirit of his *Sketch-Book* is a permanent influence in Anglo-American relations. *Consult Works* in Knickerbocker edition; *Life*

and *Letters*, P. M. Irving (nephew), 3 vols., 1909; *Life*, S. T. Williams, 2 vols., 1936; *The World of W.L. Van Wyck Brooks*, 1944.

Irvington. Town of New Jersey, U.S.A., in Essex co. It adjoins Newark on the S.W., and is served by the Lehigh Valley rly. Chiefly a residential suburb of Newark and New York, it has smelting works, chemical plants, and makes machine tools and cutlery. It was called Camptown until 1852, when it was renamed in honour of Washington Irving. Pop. 55,328.

Irwell. River of Lancashire, England. Rising on the E. side of Rossendale Forest, a few miles from Burnley, it flows S. to Manchester and then S.W. to the Mersey. Its lower course forms part of the Manchester Ship Canal (*q.v.*). Its length is about 30 m.

Irwin, LORD. Title borne by the 1st earl of Halifax (*q.v.*) when he was viceroy of India from 1925.

Isaac. One of the Hebrew patriarchs, the only son of Abraham (*q.v.*) by his wife Sarai, and the inheritor of the promises made by God to his father (Gen. 21, 22, 24, 27, 35). A prosperous farmer and stock-keeper in Palestine, he is said to have been forty years old when he married Rebekah, and his sons Jacob and Esau were not born till twenty years later. Isaac is the first patriarch mentioned as sowing seeds, and was also notable as a well digger. He is said to have died at the age of 180, and was buried with his father at Machpelah.

Isaac I Comnenus (d. 1061). East Roman emperor, 1057-59, first imperial representative of the Comnenus family. He led a conspiracy by which he supplanted Michael VI, and during his brief reign, which ended with his retirement to a monastery, did his utmost to set the finances in order.

Isaac II Angelus (d. 1204). East Roman emperor, 1185-95 and 1203-04. Belonging to a noble Greek family of Asia Minor, he was proclaimed emperor in place of Andronicus I. Distrusting the Crusaders under Frederick Barbarossa (the third Crusade), he persistently maintained a hostile attitude towards them, and formed an alliance with Saladin. The Bulgarians took up arms, and after two severe defeats—at Beroea (1190) and Arcadiupolis (1194)—Isaac was blinded and imprisoned by his brother Alexius, April 10, 1195. On the entry of the Latins into Constantinople, he was taken from prison and again set on the throne with his son Alexius,

July 18, 1203, but early in 1204 they were overthrown. Alexius was strangled, and Isaac died of fright.

Isaacs, GEORGE ALFRED (b. 1883). British politician, born in London. He was Labour M.P. for Gravesend, 1923-24; for N. Southwark, 1929-31 and 1939-50; for Southwark from 1950. Secretary of the National Society of Operative Printers and Assistants, he had been mayor of Southwark, 1919-21. He held office as minister of labour and national service from 1945.

Isabella. Feminine Christian name. A French variant of Elizabeth, its Hebrew meaning is God hath sworn. Isabel and Isabeau are forms of it; also Isobel. It has been popular among royalties, notable bearers being the queens of Spain and the wife of Edward II. King John married Isabella, a daughter of the count of Angoulême, a member of the royal house of France, and they had a daughter Isabella (1214-41) who became the wife of the emperor Frederick II. Charles VI, king of France, married the lady who is known as Isabeau of Bavaria, and their daughter Isabella (1389-1419) became the child wife of Richard II. Philip Augustus of France married Isabella of Hainault, and Edward III had a daughter Isabella (1332-79).

Isabella (c. 1292-1358). Queen of Edward II of England. Daughter of Philip IV, the Fair, king of France, she was betrothed to Edward in 1303, and married to him five years later, Jan., 1308. Edward neglected his wife from the beginning, and about 1324 she became practically a prisoner. She made her way to France, however, where, with her lover, Mortimer, she planned an invasion of England. Landing at Harwich in 1326, she captured her husband and Despenser, returned to London and proclaimed Edward III as king. Causing her husband to be murdered at Berkeley Castle, she and Mortimer held the regency until 1330, when Edward III seized both and sent his mother into retirement at Castle Rising, Norfolk. She died at Hertford, Aug. 23, 1358.

Isabella I (1451-1504). Queen of Castile. Daughter of John II of Castile and Leon, and a descendant of John of Gaunt, she was born at Madrigal, April 22, 1451. She married Ferdinand of Aragon in 1469, and in 1474, with her husband, ascended the throne of Castile and Leon. Five years later Ferdinand succeeded to the

throne of Aragon, and thus the greater part of Spain was united under one monarchy. Isabella died Nov. 26, 1504. *See* Ferdinand V; Spain: History.

Isabella II (1830–1904). Queen of Spain. Born at Madrid, Oct. 10, 1830, the daughter of Ferdinand VII, she benefited by a decree which set aside the Salic law, and at the age of three succeeded her father under the regency of her mother, Maria Christina. This brought into the field a claimant in the person of her uncle, Don Carlos, who for the next seven years maintained constant conflict for his rights. In 1840 Maria Christina resigned the regency in favour of Espartero, and in 1843 Isabella was declared of age by the Cortes.

The question of her marriage became an international affair in which England and France were involved. Eventually Isabella was compelled to marry her cousin, Don Francis of Assisi, a match which accounted for most of the unhappy events which afterwards marred Isabella's life. Continued insurrections broke out, and, in 1868, she was deposed and banished, and in 1870 abdicated in favour of her son, Alphonso XII. The remainder of her life was passed in Paris, where she died, April 10, 1904. *See* Carlos; Spain: History.

Isabey, JEAN BAPTISTE (1767–1855). French painter and lithographer. Born at Nancy, April 11,



J. B. Isabey,
French painter
Self-portrait

1767, he went to Paris in 1786, where he studied under François Dumont and David. He displayed exceptional skill in miniatures and secured the patronage of Napoleon I and Josephine. He produced several esteemed lithographic plates. He died in Paris, April 18, 1855. His son Louis (1803–86) was also a painter. *Consult* The Little Court Painter, M. Osmond, 1947.

Isaeus (4th century B.C.). One of the ten Attic orators. Probably born at Chalcis in Euboea, he taught rhetoric at Athens during 390–350 B.C. He is said to have been the pupil of Isocrates and the teacher of Demosthenes. A professional writer of speeches for delivery in the law courts, 50 orations under his name, of which 10 are extant in complete form, were

considered genuine. They deal with the subject of wills and inheritance, and are a valuable source of information on Athenian testamentary law. *Prom.* I-see-us.

Isaiah. A Hebrew prophet, the author of one of the books of the Bible. A son of Amoz, he lived in



Isaiah as depicted by Michelangelo on the ceiling of the Sistine Chapel, Rome

the 8th century B.C. He seems to have spent his life in Jerusalem and received his call "in the year that King Uzziah died," probably about 740 B.C. His wife is described as the prophetess (Isa. 8, v. 3), and his children were given names which were watchwords of his teaching, *Shear-jashub* (A-remnant-shall-return) and *Mareshal-hash-bar* (Speeds-spoil—booty—hastens). His mission was to proclaim the will of God for his country in both domestic and international politics. The reign of Uzziah had brought a period of prosperity to Judah, but Isaiah perceived danger. There was widespread corruption, and oppression by the ruling class; while Judah, together with the neighbouring kingdoms, was constantly under threat of domination by Assyria.

Isaiah sternly denounced the corruption and injustice at home (chap. 3), declaring that destruction at the hands of Assyria would be the inevitable punishment for rebellion against God's laws, and that safety, at least for a remnant, could be found only in obedience to Him (chap. 1). He condemned the policy of alliances, first with Egypt and Ethiopia, and later with Babylon. His work was to some extent successful; the reforms of Hezekiah (2 Kings 18,

vv. 4–5) were brought about by the prophetic movement in which Isaiah played so great a part, and the country did retain a precarious independence until its final subjugation by Babylon in 586 B.C.

Most modern scholars agree that not all the Book of Isaiah dates back to the prophet. There are marked differences of style, language, and content between chapters 1–39 and the rest of the book; less certainly, between chapters 40–55 and 56–66. These three sections are referred to respectively as First, Second, and Third Isaiah (or Proto-, Deutero-, and Trito-Isaiah). Second Isaiah is chiefly notable for passages speaking of the Servant of the Lord, in which the O.T. reaches its zenith (chaps. 42, vv. 1–4; 49, vv. 1–6; 50, vv. 4–9; 52, v. 13–53, v. 12). Resemblances between these passages and the life of Christ have led Christians to regard these as Messianic prophecies. But probably the author, writing during the Exile, had in mind the universal mission of Israel for the salvation of the world, and was attempting to explain why God had allowed his chosen people to undergo the humiliation of exile. The remainder of the book, written after the return from the Exile (probably between 516 and 444 B.C.), carries on the same teaching of universalism, and also denounces idolatry in the old prophetic tradition.

Bibliography. The Book of the Prophet Isaiah, G. W. Wade, 1911; The Second Isaiah, C. C. Torrey, 1928; Introduction to the Books of the O.T., W. O. E. Oosterley and T. H. Robinson, 1934.

Isallobar. A map line drawn through places where equal changes of barometric pressure have occurred during the same period. An isallobaric chart may represent e.g. the distribution of pressure differences in half millibars over three hours. Isallobars outline regions of falling or rising pressure, the enclosed areas on the charts being usually regular in form. *See* Isobar.

Isandhlwana OR ISANDULA. Locality in Natal, S. Africa. It stands near the Tugela river, 105 m. N. of Durban, and is noted as the scene of a fight between the British and the Zulus, Jan. 22, 1879. A British army which had encamped here went out against the enemy, leaving a small force in charge of the camp. This was attacked by 10,000 Zulus, who formed part of Cetewayo's army, and fighting to the last, was

destroyed. The British losses were 800, and those of the native allies 500, only about 40 Europeans escaping alive. All the transport was taken. The S. Wales Borderers had only six survivors out of six companies. At Queen Victoria's wish, this was the last occasion on which British colours were carried into action. See Zulu Wars.

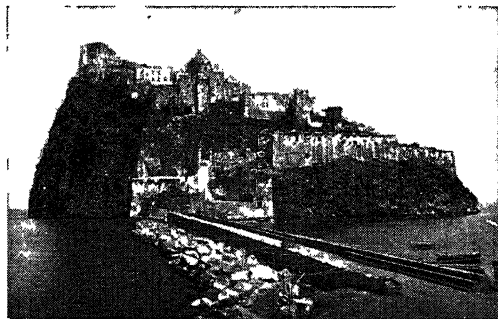
Isar. A river of Bavaria, Germany. Rising in Austrian Tirol, high up among the Alps, it flows N.E. through Bavaria to join the Danube near Deggendorf. Munich and Freising are on its banks, and its length is about 180 m., but owing to its rapid current it is not navigable.

Isarithm (Gr. *isos*, equal; *arithmos*, number). A term applied in general to a line on a map, such as contour lines, isobars, etc. An isarithm joins all points which have the same elevation, atmospheric pressure, etc., and separates areas of higher from those of lower pressure, etc. The term isopleth is sometimes similarly used. Lines referring to density of population are the chief isarithms without a special name.

Isatin (Gr. *isatis*, woad). An orange-red compound, discovered in 1841. It is prepared from indigo by the oxidising action of nitric or chromic acid. By the action of alkalis it is converted into isatinic acid, and into aniline on fusion with caustic potash. It is soluble in alcohol and ether.

Isauria. An ancient district of Asia Minor, between Pisidia and Cilicia. Its inhabitants were a rude and warlike people, addicted to brigandage. In spite of defeats by the Romans, it was not until the reign of Anastasius in the 6th century that they were finally conquered. Two East Roman emperors, Zeno and Leo III, were Isaurians by birth.

Ischia. Island of the Mediterranean, belonging to Italy. It is the ancient Pithecusa or Aenaria.

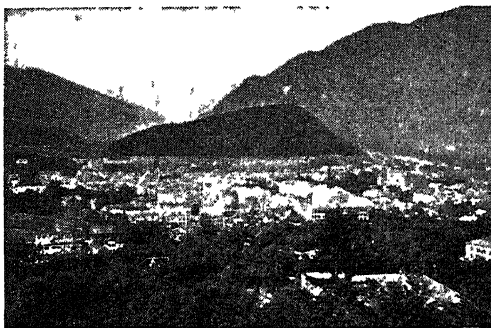


Ischia. The 15th century castle, approached from the island by a stone causeway

It lies off the Campanian coast, 16 m. W.S.W. of Naples, and is included in the prov. of Naples. It is 20 m. in circumference and has an area of 18 sq. m. Of volcanic origin, the island is mountainous, fertile in the valleys, and most picturesque. Its highest point is Monte Epomeo (alt. 2,588 ft.). There are hot springs at Porto d'Ischia.

Ischia, the capital, is the seat of a bishop and has a 15th century castle. Casamicciola, noted for its hot springs, and Forio, a port on the W. coast, are other towns. Wine, corn, oil, and fruit are produced; tile and pottery making, straw plaiting, and fishing, are carried on. *Pron.* Ees-keea.

Ischl. Town and watering-place of Upper Austria, in the Salzkammergut. It is on the river Traun, at



Ischl. The Upper Austrian watering-place from the north, with the wooded hill of Siriuskogel

its confluence with the Ischl, 30 m. S.E. of Salzburg. Its fine buildings include a kurhaus, theatre, handsome parish church (restored 1877-80), and numerous villas of the Austrian nobility. Here are saline springs, including pine-cone, sulphur, salt water, mud, and vapour baths, with excellent bath establishments, salt works, and hydro-paths. *Pop.* 9,875. *Pron.* Ishl.

Iseo. Lake of N. Italy. It lies between the provs. of Bergamo and Brescia, 15 m. E. of Bergamo, and 609 ft. above sea level, and is traversed by the river Oglio, an affluent of the Po. It is 16 m. in length by $1\frac{1}{2}$ m. to 3 m. broad, has an area of 24 sq. m. and a maximum depth of 980 ft. It contains the island of Siviano. Iseo, a thriving town, with ancient walls and castle, is on a

branch line from Brescia, along the E. shore. There is trade in cereals, olives, sardines, eels, chestnuts, and wine; while silk spinning and dyeing are engaged in. Iseo is a favourite resort of tourists, and is the ancient Lacus Sebinus.

Iseran, Col. d'. Mountain pass of the Graian Alps, France. It is near the Italian frontier, in the dept. of Savoie, between Mont Cenis and the Little St. Bernard, and its alt. is 9,080 ft. The route leads from the Isère valley to that of the Arc. A splendid view of the wild valley of Bonneval and the peaks and glaciers around it may be obtained from the pass.

Isère. River of France. It rises in the Graian Alps on the Italian frontier and flows mainly W., joining the Rhône near Valence. Its length is about 180 m., but its

swift current makes it unsuitable for navigation. Its chief tributaries are the Drac, the Arc, and the Breda.

Isère. Department of France. Lying E. of the Rhône, which bounds it N. and W., it is mountainous in the E. and S., where the Alps enter it, the Aiguille du Midi being over 13,000

ft. high. Grenoble is the capital; Vienne is another important place. Isère was formerly part of Dauphiné, and its area is 3,178 sq. m. *Pop.* 574,019.

Iser-Gebirge. A mt. range of Central Europe, on the frontiers of Silesia and Bohemia. It forms the N.W. continuation of the Riesengebirge. The highest summits are the Tafelfichte (3,680 ft.) and the Heufuder (3,630 ft.).

Isernia (anc. *Aesernia*). City of Italy, in the prov. of Campobasso. Situated among the Apennines, 78 m. by rly. N. of Naples, it is noted for its mineral springs. A Samnite city, its medieval walls rest on cyclopean foundations. Units of the British 8th army on Nov. 4, 1943, took Isernia from the Germans, finding some churches damaged by bombs.

Iseult or **Yseult**. Two characters in the Morte d'Arthur. One, generally known as The Beautiful Iseult, was the daughter of King Anghuish of Ireland, and married King Mark of Cornwall. She fell in love with Sir Tristram, who married the other Iseult of the White

Hands, daughter of King Howel of Brittany. There are many spellings of the name. *See* Tristan and Isolde; Tristram.

Iseyin. Town of Nigeria. It is situated in the Western Provinces about 50 m. N.N.W. of Ibadan and is a road communications centre. Pop. 48,470.

Isherwood, CHRISTOPHER WILLIAM BRADSHAW (b. 1904). A British novelist and dramatist. Born at Disley, Cheshire, Aug. 26, 1904, he was educated at Repton, Corpus Christi, Cambridge, and King's College, London. He taught English in Berlin, 1930-33, was a London journalist, 1934-36, and did script work for Gaumont British. A first novel, *All the Conspirators*, was published in 1928, and later novels included *Mr. Norris Changes Trains*, 1935; *Good-bye to Berlin*, 1939; *Prater Violet*, 1946. Isherwood collaborated with W. H. Auden in three plays: *The Dog Beneath the Skin*, 1935; *The Ascent of F.6*, 1937; *On the Frontier*, 1938.

Ishim. River of the U.S.S.R. It rises in the mountains to the E. of Akmolinsk, Kazakh S.S.R., runs W., then N.N.E., and flows into the Irtysh at Ust-Ishimske, Omsk region, after a course of about 1,000 m. The chief towns on its banks are Ishim and Petro-pavlovsk.

Ishim. Town in Omsk region of R.S.F.S.R. It is 160 m. S.S.E. of Tobolsk, on the left bank of the Ishim, on the rly. from Sverdlovsk to Omsk. The chief trade is in rye and rye-flour. A great fair is held annually in Dec. The town is one of the oldest in Siberia.

Ishmael. Son of Abraham by his wife's Egyptian maid Hagar. The jealousy of Sarai and the birth of Isaac some years later led to Hagar being sent away with her son, and settling in the wilderness of Paran, where Ishmael married an Egyptian (Gen. 16-25). He was famed as an archer. His descendants occupied the land E. of Palestine. Mahomet claimed descent from Ishmael, who is said to be buried with his mother at Mecca.

Ishogo. Negroid tribe living in French Equatorial Africa. They occupy large villages on both banks of the middle Ngunye and in the upper Ogowe uplands. Their W. Bantu dialect is spoken also by the neighbouring Okanda and Apinji.

Ishtar. Babylonian and Assyrian goddess. She is a primitive Semitic deity, with attributes resembling those of the Phoenician Ashtoreth and the Syrian Atagatis,

and her worship absorbed earlier Sumerian cults, as at Erech, Nineveh, and Arbela. She had a chapel in the Esagila temple at Babylon, approached from the resplendent Ishtar gate. Ishtar appears as the queen of heaven (Jer. 44), mother of all life, and goddess of love and war. *See* Babylonia and colour plate.

Isidore (c. 560-636). Spanish scholar and ecclesiastic. Born at Cartagena, he succeeded his brother Leander, bishop of Seville, in 600. He presided over the councils of Seville and Toledo, and did much to restore discipline in the Church of Spain. He was the author of a great encyclopedia, in which he endeavoured to summarise all human knowledge.

Isin or **NISIN.** Sumerian city on an unidentified site, probably N. of Erech, S. Babylonia. A Nippur king-list records a dynasty of 16 kings following that of Ur. Founded by a Semitic immigrant, Ishbiura, it lasted 225 years until overthrown by Rimsin of Larsa, about 2115 B.C. *See* Babylonia.

Isinglass (Ger. *Hausenblase*, sturgeon bladder). Gelatinous substance obtained by drying the swimming bladder of the sturgeon and other fish. It is principally used for clarifying wines, beers, and spirits, and in cookery for making jellies.

Isis. Egyptian goddess. Originally local, she became pre-eminent—the great mother (Demeter), sister-wife of Osiris, and mother of Horus. Represented in human form, she bore, after assimilation with Hathor, the cow-horned sun-disk. Her XXX-dynasty temples were at Behbet and Philae, where her worship ceased about A.D. 560. In Hellenistic times she was also revered in Greece, Italy, and Roman Britain, having her tonsured clergy, vestments, processions, and mysteries, partly assimilated by, partly imitative of, early Christianity. *See* Egypt.

Isis. Name given to the upper part of the Thames about Oxford. It was applied by Camden, Leland, and others. An undergraduate weekly magazine at Oxford has this title. *See* Thames.

Iskanderun. Turkish name for the former Syrian seaport better known as Alexandretta (*q.v.*).

Iskasmī or **ISHKASHMI.** Language of the Galcha sub-group of the Iranian branch of Aryan. It is spoken in the Ishkasham hill-tract, Badakshan prov., Afghanistan. It was unknown until a vocabulary and folk-tales were collected there by Stein in 1915, is allied to

the dialects spoken at Zebak and Sanglich, higher up the N. slope of Hindu Kush, and contains words reminiscent of the Zend-Avesta.

Isker. River of Bulgaria. It flows N. through the N.W. of the country to join the Danube above Corabia. Its length is 120 m. The upper Isker crosses the basin of Sofia and its valley is the pass at the Great Balkans.

Isla. A river of Scotland. It rises in the Grampians on the N.E. of Angus, and flows 48 m. S.E. and S.W. through Strathmore to the Tay, which it joins 4½ m. S.W. of Coupar Angus. It is a salmon and trout stream, and makes two fine falls—Reekie Linn and the Slugs of Auchrannie, both in the Angus ravine, the Den of Airlie. *Pron.* I-la.

Islam (Arab., making of peace). Name given in the Koran to the Mahomedan religion. As translated by Rodwell, Sura, 3, v. 79, reads: "Whoso desireth any other religion than Islam, that religion shall never be accepted from him, and in the next world he shall be among the lost." Allah is called the Author of Peace; and Islam is held by all believers in it to lead to the Abode of Peace. *See* Mahomedanism; Mahomet.

Islamabad. A town of Kashmir. It is 28 m. S.E. of Srinagar and stands on an eminence overlooking the Jhelum, here spanned by a wooden bridge. It is noted for its Kashmir shawls. Until the 15th cent. it was known as Anant Nag, after its holy reservoir. Pop. 10,700.

Island. Piece of land entirely surrounded by water. Islands are usually classified as continental or oceanic. Continental islands consist of the same rocks as the neighbouring mainland, are usually surrounded by shallow seas, the floor of which forms a continental shelf, and have similar flora and fauna to the mainland.

Such islands belong to three groups: islets composed of resistant rocks, such as the Bass Rock, the surrounding softer strata having been worn away; large islands, such as the British Isles and those of N. Canada, separated from the continent by comparatively narrow, shallow channels; and the festoons of islands such as Japan, which are characteristic of the shorelands of the Pacific Ocean. A better name for such islands is *destructural*, which indicates that they are the product of the destructive forces of erosion, earth movement, etc.

Under this term Madagascar and Australia are included. They are

both relics of the former great southern continent of Gondwanaland. Similar smaller islands are Sardinia and Corsica, remains of an ancient Tyrrhenis, most of which is submerged.

Oceanic islands are usually far distant from the continental shores, surrounded by deep water, and are generally of coralline or volcanic origin. They occur most frequently in the Pacific Ocean; the largest of them are in the Hawaiian, Fijian, New Hebrides, and Samoan groups. Coralline islands, in general, are based upon submerged mountain peaks or volcanoes. Islands of this class are better called constructional, as they have been built up in the development of the earth's existing superficial conformation. This term includes, in addition to oceanic islands, those which occur along continental coasts either as developments from shingle-bars and sand-banks or as temporary outlying portions of a growing delta. The Bermudas, the Florida cays, and many W. Indian islets are constructional, but the main W. Indian islands, relics of an ancient Antillia, are destructional.

The *s* in island is due to a confusion with the old Fr. *isle*, the word being really compounded of A.S. *ig*, island, and land.

Islands, BAY OF. (1) Bay of Newfoundland. On the W. coast, it penetrates some distance inland by three branches, receiving the waters of the Humber, and containing numerous small islands. Humbermouth, at the head of the bay, is on the main Newfoundland rly. (2) A commodious, secure, and deep harbour in North Island, New Zealand, on the E. side of the Auckland peninsula. The surrounding land is the Bay of Islands co., and Russell and Opuā are ports on the bay.

Islandshire. Formerly a detached portion of the co. of Durham, England. Islandshire consisted of land in the neighbourhood of Berwick-on-Tweed, together with the Farne Islands; it was incorporated with Northumberland in 1844.

Islas Malvinas. Another name for the Falkland Islands (*q.v.*).

Islay. An island of Scotland, most southerly of the Inner Hebrides, belonging to the co. of Argyll. Its greatest length is 25 m., its greatest breadth 19 m., and its area is 235 sq. m. The inhabitants are chiefly engaged in dairy farming and in rearing sheep and cattle; oats, barley, and potatoes are grown. Distilling

is an important industry. The island has a great quantity of peat, and some slate and marble are quarried. The surface is generally level, although there are several peaks over 1,000 ft. high. Lochs Indaal and Gruinart almost cut the island in two, making the W. portion a large peninsula, known as the Rhinns.

Off Rhinns Point is Oversay, an island with a lighthouse. The S. end of the island is known as the Mull of Islay. Bowmore is the chief town; others are Bridgend, Port Ellen, and Port Askaig, all on the coast. There is regular steamboat communication with Glasgow and other ports. Islay was the headquarters of the MacDonalds, lords of the Isles, and afterwards passed to a branch of the Campbells, whose seat was Islay House, near Bridgend. Pop. 5,743. The Sound of Islay separates the island from Jura. Its length is about 13 m., and it is about 1 m. wide.

Isles, LORD OF THE. The title borne by the chieftains formerly ruling the Western Isles of Scotland, surviving only as one of the titles of a prince of Wales. The first of the line was Somhairle or Somerled, who helped to expel the Norse invaders from parts of the Hebrides in the 12th century, and exercised almost supreme authority over Argyll and the Isles until his death in battle with Malcolm IV of Scotland in 1164. His descendants, after much fighting, secured suzerainty over the Isles.

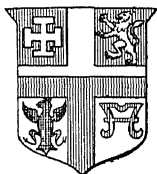
John MacDonald, a descendant of Somhairle, took the title about 1334, and is believed to have done homage to David II for his possessions about 1344. Edward III of England treated John as an independent chieftain in his dealings with David II, 1356-57. John was succeeded in 1387 by his son David who held the title until his death in 1426. Alexander, 3rd lord, made

a determined rising against James I, and on his death was actually engaged in another conspiracy against James II. His successor, John, was also turbulent and rebellious, and in 1493 his estates were declared forfeit by the Scottish parliament, and after his death in 1498 the supremacy in the W. passed to the Campbells.

Islets of Langerhans. Island-like areas in the pancreatic tissue. First described by Langerhans in 1869, they secrete insulin (*Lat. insula*, island) which enables the muscles to utilise carbohydrates. Failure of this secretion results in diabetes. *See* Insulin.

Isleworth. Parish of Middlesex, England, forming with Heston a borough. *See* Heston and Isleworth.

Islington. Borough of London. Most populous of London boroughs N. of the Thames. It is bounded S. by Finsbury and Shoreditch, N. by Hornsey, E. by Stoke Newington, and W. by St. Pancras, and covers 3,092 acres. The town hall in Upper St. was finished in 1929. In the burial ground of the parish church of S. Mary, rebuilt 1754, lie Sir James Stewart and Sir George White, who killed each other in a duel in the time of James I. Adjoining is a hall built as a memorial to Dr. Daniel Wilson, bishop of Calcutta, once vicar of Islington, who founded the Islington Clerical Meeting in 1827. The Metropolitan Cattle Market, transferred from Smithfield, was held in Caledonian Road, 1855-1939. The Royal Agricultural Hall, 1861-62, is notable for cattle and dog shows. In Liverpool Road is the London Fever Hospital.



Islington arms

On Islington Green is a statue of Sir Hugh Myddelton (*q.v.*). Until early in the 19th century Islington—the Iseldon and Isendon of Domesday Book and once "merry Islington"—was a village enclosed by fields. It was famous for its archery butts, dairy produce, mineral spa, tea gardens, and ducking ponds.



Islington. Site of the former Angel Inn, now a restaurant (left). *See* also illus. under Angel Inn

Alexander Cruden lived in Camden Passage; Charles and Mary Lamb at 64, Duncan Terrace, formerly Colebrook Cottage. Cloudesley Institute and Square commemorate one of Islington's benefactors, Richard Cloudesley. Three members are elected to parliament. Pop. est. 234,900. See Angel Inn; Canonbury; Highbury.

Islip. Township of New York, U.S.A., in Suffolk co., on Long Island. It has several rly. stations and an airport. The Central Islip and the Pilgrim state hospitals are the country's largest institutions for the insane. Some of the villages are noted for clams and oysters. In the vicinity are summer resorts and beaches. On Fire Island many writers and artists have homes. The township, named by settlers from Islip, Oxon., was incorporated in 1710. Pop. 51,182.

Ismaili or ISMAILIA. Town of Bessarabia, now within Moldavia S.S.R. It stands on the left bank of the N. arm of the Danube, 40 m. E. of Galatz. It trades in cereals and exports grain, wool, tallow, and hides. Once a Turkish fortress, it was three times taken by the Russians, handed over to Rumania in 1856, and incorporated with Russia by the treaty of Berlin in 1878. As a result of the First Great War, Bessarabia was given to Rumania, but reverted to the U.S.S.R. in 1940. Pop. 26,132. See Bessarabia.

Ismailia or ISMAILIYA. Town of Egypt. It stands on Lake Tim-sah, through which passes the Suez Canal, and was the headquarters of works during the period of construction; also of the British Mediterranean expeditionary force in 1916. It is the seat of a local governor. Pop. 10,000.

Ismail Pasha (1830-95). Khedive of Egypt. The second son of Ibrahim Pasha, he was born in Cairo, Dec. 31, 1830, and after an education in Paris entered the diplomatic service. Viceroy of Egypt, 1863, he was four years later appointed khedive by the



Ismail Pasha,
Khedive of Egypt

sultan, and by 1872 had cast off his former allegiance to the latter. He started ambitious but unworkable projects of reform, and to pay debts had to sell his shares in the Suez Canal to the U.K. Forced to submit to Anglo-French financial control, he dismissed a ministry

in 1879 and was straightway deposed by the sultan. He died at Constantinople, March 2, 1895. See Egypt: History.

Ismay, HASTINGS LIONEL IS-MAY, 1ST BARON (b. 1887). British soldier. Educated at Charterhouse and Sandhurst, he was commissioned in 1905, and in 1907 joined the 21st cavalry. He served in Somaliland, 1914-20, and then filled a succession of staff appointments in the U.K. and India,



Lord Ismay,
British soldier

being military secretary to the viceroy, 1931-33. In 1938 he became secretary to the committee of imperial defence. As major-general he was chosen by Winston Churchill in 1940 as chief of his personal staff at the ministry of defence, with the duty of liaison between the war cabinet and chiefs of staff. He was promoted lieutenant-gen. in 1942 and general in 1944. Made a baron in Jan., 1947, he was, March-Nov. 1947, on the staff of Lord Mountbatten when the latter was viceroy and later governor-general of India.

Ismay, THOMAS HENRY (1837-1899). British shipowner. Born at Maryport, Jan. 7, 1837, the son of a shipbuilder, he was educated at Carlisle, and began his business career in 1853 in a shipbroker's office in Liverpool, starting in business for himself a few years later. In 1867 he bought a fleet of Australian clippers which became the White Star line, and next year, with W. Imrie, he founded the firm of Ismay, Imrie & Co. Ismay died Nov. 23, 1899.

Ismid, or IZMIT. Town of Asia Minor, the ancient Nicomedia. Situated about 50 m. S.E. of Istanbul near the head of the gulf of Ismid, it is the capital of the vilayet of Kocaeli, which has a pop. of 418,763. It is connected with Uskudar by rly. The seat of a Greek and of an Armenian bishop, it contains a fine 16th century mosque. Ismid was once the capital of the kings of Bithynia and a flourishing city. Tobacco cultivation is important in the vilayet.

Isobar (Gr. *isos*, equal; *baros*, weight). Map line through places of equal barometric pressure at a given time. The widest use is in the preparation of weather forecast charts, when isobars have to be drawn for areas of the N.

hemisphere at frequent intervals throughout the day. To compensate for the effects of altitude the readings are corrected before being plotted on the charts. Pressure on one side of an isobar will be higher than on the other, and the isobar if continued over a large enough area will finish where it started, i.e. isobars form closed curves. Anticyclones are examples of such systems of contours, the pressure being highest at the centre; the reverse applies to depressions. Distribution of atmospheric pressure is indicated in the daily weather report. See Barometer; Buys-Ballot's Law; Pressure.

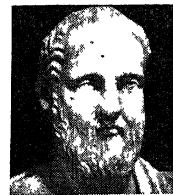
Isobutylene (C₄H₈). Isomer of the hydrocarbon butylene. It is a gas at ordinary temperatures, but liquefies in freezing mixture. Three isomeric butylenes are known.

Isochronism (Gr. *isos*, equal; *chronos*, time). Oscillation of a body in the same time whatever the amplitude of oscillation. The term was first used by Leibniz to denote a curve or isochronal line on which a heavy body descends in equal time. The vibrations of spiral watch-springs and the cycloidal pendulum are examples of isochronism.

Isocline (Gr. *isos*, equal; *klinein*, to incline). In geology, term used to describe a fold (*q.v.*) in which the beds have been so compressed that the strata on either side of the crest or trough are approximately parallel. Isoclinal folds occur where intense mountain building movements have occurred, e.g. as in the Alps and Scottish Highlands.

Isoclinic. Line drawn on a map through places for which the angle of magnetic dip is the same. Isoclinics follow approximately the lines of latitude on the earth's surface. The line of zero declination is known as the magnetic equator. See Equator; Magnetic Needle.

Isocrates (436-338 B.C.). One of the so-called ten Attic orators. A pupil of the philosopher Socrates in early life, he gave up philosophy, and started as a writer of speeches for clients to deliver in law cases. Unsuccessful at this profession, he started a school for preparing younger men



Isocrates,
Athenian orator
From a bust

for public life. He continued to compose speeches, but these dealt mostly with public affairs, and were intended to be read. He was thus the first political pamphleteer.

Isocrates cherished the dream of a Greece united for a great war against the Persians. He looked to Philip of Macedon to lead the Greek hosts, but that dream was rudely dispelled when Philip defeated the Athenians at Chaeronea. It is said that Isocrates committed suicide on hearing the result of the battle. Of his 21 extant speeches, the finest is the *Panegyricus*, in which he extols Athens as the natural leader of Greece. Isocrates occupies a notable place in the history of literature. His clear, smooth, and flowing Greek prose became the standard style for orators and schools of rhetoric. These in turn passed it on to Cicero. *Pron.* I-soc-rateez. *See* Greek Literature.

Isodimorphism. A chemical term. A compound which crystallizes in two or more forms possessing different molecular structures is said to exhibit dimorphism or polymorphism. Another phenomenon, isomorphism (*q.v.*), is shown by compounds which have an analogous composition and a closely related crystalline form. When two or more analogous substances are both dimorphous and isomorphous, the phenomenon is called isodimorphism. The isometric pyrite group (pyrite, smaltite) and the orthorhombic marcasite group (marcasite, safflorite) are isodimorphous.

Isodynamic. Line drawn on a map passing through points on the earth's surface where the horizontal components of the earth's magnetic field are the same. The general trend of isodynamics is similar to that of isoclinics (*q.v.*).

Isogonic. A line drawn on a map through points having equal magnetic declination. The lines generally run N.-S. The angle for zero declination is called the agonic line; it follows approximately a great circle passing through the magnetic poles, N. and S. America, Europe, India, and Australia; a great sweep, known as the Siberian oval, passes round Japan and parts of Siberia and China. Between the two portions of the agonic line, declination is easterly in the Pacific hemisphere and westerly in the Atlantic.

Isohel (Gr. *isos*, equal; *hēlios*, sun). Map line through places where the duration of sunshine is

the same for the same period. Such lines show that, on the average, there is more sunshine on the coast than inland in the British Isles, and that the Sahara is sunnier than the Belgian Congo. *See* Sunshine.

Isohyet (Gr. *isos*, equal; *hyetos*, rain). Map line through places where the total rainfall is the same during the same period. Mean annual isohyets for 30 ins. pass through all places having an average annual precipitation of that amount. In general, isohyets indicate mean conditions over a large number of years; they show the normal rainfall, and are mainly useful in the study of the seasonal distribution of raininess, and for practical purposes, *e.g.* in connection with the water supply of towns. *See* Rainfall.

Isola. Town of Istria, formerly Italian, lying within the free territory of Trieste set up under the peace treaty with Italy, 1947. On the Gulf of Trieste, it is 9 m. in a direct line and 21½ m. by rly. S.W. of Trieste. It is thus in the western Italian-speaking portion of Istria.

Isolation. Medically, the segregation of persons suffering from infectious disease, in order to prevent the spread of the malady. Isolation hospitals are provided for persons suffering from smallpox, and certain other infectious diseases, *e.g.* diphtheria and scarlet fever. For the latter, if no epidemic rages, removal to a hospital is not insisted upon if efficient precautions can be taken in the home of the patient, and proper treatment is available. Partial isolation in a private house can be effected by prohibiting all unnecessary persons from entering the patient's room, and by hanging a sheet, kept moist with carbolic acid or other disinfectant, in front of the door. The main value of this sheet is to remind the household of the need for caution. In isolation hospitals all provision is made to prevent the conveyance of infection to the outside world by nurses, servants, or patients leaving the hospital. *See* Notification; Public Health.

Isolationism. The policy, especially in the U.S.A., of avoiding any governmental action that might involve international obligations. The term is of recent origin, but the policy goes back a long way. It found notable expression in Jefferson's declaration in 1801, sometimes misattributed to Washington, that America sought "peace, commerce, and honest friendship with all nations—en-

tangling alliances with none." There was a long period during which the Jeffersonian tradition prevented foreign relations from becoming a cardinal political issue. The enormous immigration from Europe helped, for many influential new citizens had crossed the ocean deliberately to free themselves from the domestic and international troubles of their native lands.

The war with Spain in 1898 introduced the U.S.A. to a new position of responsibility in international affairs. Disturbances in China gave the country an intimate concern in the domestic politics of the Far East. After the First Great War there was a bitter struggle at Washington between forces which favoured and those which opposed the U.S.A.'s taking a leading share in determining the future of Europe. The defeat of Wilson's endeavour to bring her into the League of Nations was a conspicuous triumph for isolationism, which became the official doctrine of the Republican party and was endorsed by the country at the 1920 election.

During the 1930s most Americans regarded with indifference the development of totalitarianism in the Old World, happy in the conviction that the Atlantic insured them against the risk of being involved in any but domestic problems. The outbreak of another war was not enough to dispel that illusory sense of security. One of F. D. Roosevelt's hardest tasks was to convince his countrymen that it was no longer possible for them to hold aloof. Even after the U.S.A. had entered the war, isolationism continued to dominate an important section of congress, the press, and the community. It was gradually weakened by the course of events, but continued to exert some influence.

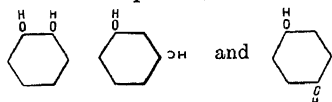
Herbert W. Horwill

Isolde. The name of this legendary character is also spelt Isult (*q.v.*).

Isomeric. Term applied to values of average monthly rainfall at a station expressed as percentages of the average yearly total. When these percentage values at a number of places for the same month are plotted, lines of equal proportion can be drawn; the outline map representing the distribution of the values for the month being known as an isomeric chart. *See* Rainfall.

Isomerism. Isomers are chemical compounds having the same number of atoms but differing

from each other in chemical and physical properties. Isomerism is the name for this feature. For instance, *a* atoms of carbon, *b* atoms of hydrogen, *c* atoms of oxygen, and *d* atoms of nitrogen may combine, by mutual attraction of the various atoms, in one, in two, or in several ways; the compounds so constructed may differ widely or differ only slightly. Chemical compounds are easily denoted by formulae in one plane, as on a sheet of paper, but they more commonly exist in fact in an arrangement in three dimensions. In a benzene ring of six CH groups arranged in a flat hexagon, it is possible to replace two atoms in hydrogen by two OH groups in three ways, producing three isomeric compounds, thus:



An example of isomerism is that of compounds in three dimensions, the structure of which is such that the molecule of one compound is the mirror image of the molecule of the other compound. Such substances usually have significant differences in optical properties and sometimes only slight differences in chemical properties. Crystals of calcium carbonate exist in more than one variety, but as the chemical properties are practically identical, such differences are not generally considered instances of isomerism.

Isometric. Name given to lines of equal volume drawn parallel to the pressure axis on an indicator diagram or meteorological map. The term is also used for the curves on meteorological charts showing the relation between pressure and temperature at constant volume.

Isomorphism. An important conception in mineralogy and crystallography. It has been found that certain minerals of analogous composition crystallise in closely related forms. The analogy is extended to the structure of crystal lattices composed of geometrically similar units, each containing a similar arrangement of the constituent atoms. This phenomenon is isomorphism; it is shown by many groups of minerals which form an isomorphous series, (e.g. calcite (CaCO_3), dolomite ($\text{CaCO}_3 \cdot \text{MgCO}_3$), magnesite (MgCO_3), siderite (FeCO_3), and rhodocrosite (MnCO_3). Members of an isomorphous series are often salts of metals contained in the same group of the periodic table.

The plagioclase feldspars are an excellent example of a series showing isomorphous mixture, there being a continuous gradation in composition, crystalline form, specific gravity, and optical properties from one extreme, albite (soda feldspar) to the other, anorthite (lime feldspar).

An allied phenomenon is isomorphous replacement, in which atoms, often of comparable size, replace others without appreciably altering the crystalline form of the compound; e.g. part of the zinc in sphalerite is often replaced by small quantities of iron, cadmium, and lead.

Isoneph (Gr. *isos*, equal; *nephos*, cloud). A map line through places where the average fraction of the sky covered by clouds is the same for the same period. Such lines show that the U.S.A. has clearer skies than W. Europe.

Isonzo. River of Yugoslavia and Italy. It rises in the Julian Alps, and flowing S. for 82 m. issues into the Gulf of Trieste, 10 m. E. of Grado. Before 1919 its course was entirely Austrian; thereafter it was wholly Italian, until the peace treaty with Italy in 1947 gave its upper reaches, above a point just N. of Gorizia, to Yugoslavia, the rest remaining Italian.

The battles of the Isonzo in the First Great War were fought between Italian and Austrian armies, 1915-17. By the beginning of June, 1915, the Austrians had retired to positions along the river, mostly on the E. bank, but with important bridgeheads, particularly before Gorizia, the chief town on the river. The terrain was mountainous and strongly fortified. The Italian general Cadorna opened the first battle with a three-fold offensive on June 9. In the N. his forces advanced into the Plezzo valley, but failed to capture Tolmino; in the S. they drove the Austrians from the flat between the river and Monfalcone, occupying Monfalcone and Castelnovo; and in the centre they crossed the river N. and S. of Gorizia, but failed to carry the height of Podgora, which commands Gorizia from the W. bank.

In the second battle the Italians attacked in the central sector, July 2, and fighting continued until the middle of Aug. The third battle opened on Oct. 18, Cadorna aiming at improving his positions in preparation for an attack on Gorizia; some progress was made, and artillery began to shell the town. Fighting continued until

Dec. The fourth battle began with a bombardment all along the river from N. of Gorizia to the sea, followed by a feint in the Monfalcone area which led the Austrians to reinforce their left at the expense of their centre. On Aug. 6, 1916, the Italians crossed the Isonzo at Sabotino and San Michele, and in three days had entered Gorizia. The attack was then switched to the S., and gains made in the Carso. During the winter both sides were preparing an offensive, and in 1917 there was more fighting, but with the disaster of Caporetto the Italians withdrew from the Isonzo for the remainder of the war.

Isosceles (Gr. *isos*, equal; *skelos*, leg). Word of Greek origin used for a triangle with two equal sides. The angles at the bases of the equal sides are also equal. See Geometry.

Isoseismal. Line drawn on a seismographical map to indicate the direction of the shock wave along which the intensity of any given earthquake is the same. See Earthquake; Seismograph.

Isostasy (Gr. *isos*, equal; *stasis*, standing still, stability). Term for the doctrine that explains the greater elevations and depressions of the earth's surface as due to the crust rising high where its material is light, and lying low where the material is heavy. According to isostasy, blocks of the crust of equal area are of equal weight irrespective of the height of the surface, and each block is supported on a layer which behaves as a fluid and upholds the overlying crust to a superficial altitude dependent on the composition of the block. Mountains were naturally at first regarded as extra masses piled upon the crust and upheld by its strength, as a lighthouse is supported by the reef on which it stands; but, according to isostasy, mountains do not rest upon a rigid foundation, but float on a plastic substratum. The evidence for isostasy may be classified in four groups:—

1. The theory was first adopted by geologists owing to the frequent coincidence between the rate of subsidence of the earth's surface and the rate of deposition of sediments upon the sinking area. They concluded that in many places the subsidence was due to the weight of the accumulating sediments.

2. Several countries have been covered by ice-caps like that of Greenland. This might have been due to heavy snowfall when the country was higher. It was found,

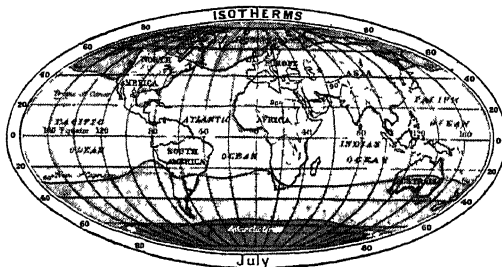
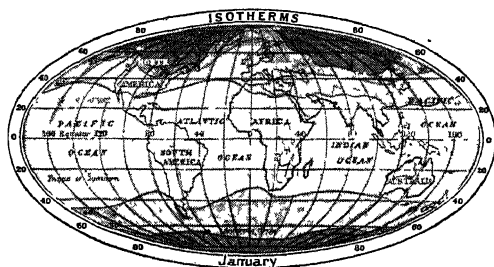
however, that the ice-covered lands were lower during their glaciation. Most of Great Britain, for example, before the Ice age stood several hundred feet higher than the present level; when the ice-cap was largest, the level of the land was lower than it is now, and with the removal of the load of ice the country was slowly upraised. Jamieson in 1865 suggested that the weight of the ice might have been the cause of the subsidence; he later attributed the subsequent recovery of level to the removal of the ice load.

The theory of isostasy is therefore strongly supported; but it does not follow that all changes in the level of the earth's crust are uniformly due to causes within the compass of the theory. Although the hills are being constantly planed down and the valleys systematically filled up, these surface features persist automatically in accord with the delicate isostatic equilibrium of the crust. See *Geology*; *Ice Age*.

Isotherm (Gr. *isos*, equal; *thermos*, heat). Map line through places where the temperature is

investigations into neon by positive ray analysis, the basis of which is to determine the ratio of the electric charge to the mass of the positive ions in an electric discharge tube containing neon or other elemental gas. Aston developed a mass spectograph, an electro-magnetic instrument designed to measure not only the charge and mass but also the velocity of particles.

Other workers proved that the isotopes of any one element all have the same atomic number *Z*, i.e. *Z* electrons outside the nucleus



Isotherm. Charts of the world's temperature belts; left, in the Southern summer; right, in the Northern summer

The stage of readjustment is not yet complete; the Baltic area, where the ice load was heaviest, is still rising.

3. Geological evidence has been supported by observations as to the varying weight of the earth's crust. It was pointed out by Pratt that levelling in N. India was liable to an error due to the pull of the mass of the Himalayas on the levelling instruments. The amount of this lateral attraction was carefully investigated and found to be much less than was expected. Its comparatively slight amount has been explained by the assumption that the height of the Himalayas is compensated for by the lightness of the material that lies beneath them.

According to the theory there is an equal weight of material in each block of the crust down to a level of compensation. On Hayford's estimate, a column 75 m. deep below the summit of the Himalayas weighs the same as a column of equal area 68 m. deep below the Bay of Bengal, where the sea is 2 m. deep, so that the two columns balance one another.

4. Hayford's support of isostasy is based on his study of the actual distribution of gravity in the U.S.A. The theory has also been supported by the determinations at sea by Hecker, who claims that the depths of the oceans correspond with the density of the mass below them.

the same for a given time or period. The mean July isotherm of 70° F. joins all places where the mean temperature for that month averaged over many years has this value.

To compensate for the decrease of temperature normally experienced with increase of height, corrections are usually applied to maps of regions where there are variations in level. This practice of reducing values to supposed equivalents at sea level decreases the practical utility of such maps, since they are not representative of the local temperature distribution.

Isotopes. Varieties of a chemical element which have virtually identical chemical properties but different atomic weights and may have different combining proportions with other elements. Tin, with a chemical atomic weight 118.70, is a mixture of substances having atomic weights between 112 and 124; these always occur in the same proportion, to give a mean of 118.70.

In 1888 Crookes first propounded the possibility of isotopes by suggesting that the departure from the whole number rule in the atomic weights of many elements was due to their being mixtures of components. In 1910 Soddy confirmed the existence of isotopes, naming them isotopic elements because they occupy the same place in the periodic table. Knowledge was extended by J. J. Thomson's

of the neutral atom, but have different atomic masses. The chemical properties of an element are assumed to be due to the arrangement and action of extra-nuclear electrons, whereas variations in atomic mass among the isotopes of the same element are due to differences in the structure of the nucleus. Most elements are mixtures of two or more isotopes, and their atomic weight represents an average. Apart from those of hydrogen, which has three isotopes with atomic masses 1, 2, and 3, the chemical properties of isotopes are for most practical purposes indistinguishable. Physical methods depending upon atomic mass are mostly used for their separation, and include:

(a) *Diffusion.* This depends on the fact that the rates of diffusion of atoms or molecules are inversely proportional to the square roots of their masses. Hertz utilised the diffusion method to separate the isotopes of neon, his apparatus consisting of 48 porous diffusion tubes incorporated in 24 pumps connected in cascade.

(b) *Thermal diffusion.* Introduced by Claudius and Dickel, this depends on the phenomenon that in a mixture of gases there is tendency for the heavier molecules to be attracted to the cold part of an unequally heated enclosure, and for the lighter molecules to be attracted to the hot part. In a vertical tube a central heated wire

has the effect of separating light and heavy isotopes in the gas; thermal conversion thereupon causes the light isotopes to flow to the upper end of the tube and the heavier to travel downwards.

(c) *Mass spectograph*. Both (a) and (b) yield only slight separation at each stage, necessitating a large number of stages. The mass spectograph as yet can ionise only a small fraction of gas to form the initial beam essential to separation, but has proved valuable in obtaining the final stage in the isotopic separation of elements already treated by (a) or (b).

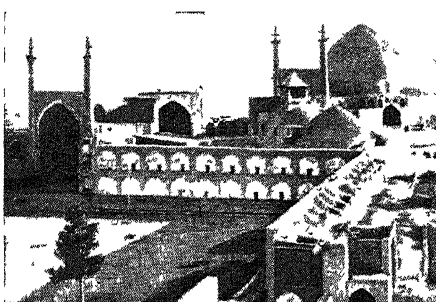
(d) *Electrolytic separation*. This is used for the isotopic separation of light elements such as hydrogen. The different ionic mobilities of heavy and light hydrogen in the solution are caused to yield an increasing percentage of heavy water. To obtain a tenth of a gramme of heavy water, electric current in the region of 3,000 ampere hours is needed.

(e) *Reaction separation*. This involves exchange reaction between isotopically different molecules. With a gas and a liquid in which light and heavy molecules are exchanging, an appreciable difference in concentration of light and heavy isotopes will exist in the gaseous and liquid phases. See Atom; Chemistry; Physics.

Isotropy (Gr. *isos*, equal; *tropos*, character). In physics, the property of a body by which it has the same characteristics in any direction about a point. All liquids and gases are isotropic. Crystals are said to be optically isotropic when they have only one index of refraction for light of each colour. When bodies exhibit different properties in different directions they are said to be aeolotropic or anisotropic. Bodies which are normally isotropic may become aeolotropic under the action of external forces; glass subjected to strain becomes doubly refracting.

Isovol. One of a series of lines drawn on a map of a mineral area to indicate the volatile content of coal seams. Isovals provide an index of the volatile and chemical nature of the coal, and shows where each different type occurs. An isovol map usually contains a graph giving the volatile and carbon percentages, calorific value, and coking properties.

Ispahan or ISFAHAN. City of Persia, the ancient Aspadana, and formerly capital of the country. It is in the prov. of Ispahan, on a fertile tableland 5,500 ft. above sea level, and is about 200 m. S.



Ispahan, Persia. The Grand Mosque

of Teheran. During its greatest prosperity under Shah Abbas, 1586–1628, it was one of the largest cities of Asia, with a pop. of nearly a million, and possessed many palaces and other fine buildings, some of which still stand, notably the Palace of the Forty Pillars, the Chihil Situn, and the Grand Mosque. It was partly destroyed in 1722. A large trade is carried on in tobacco, opium, cotton, and fruits, particularly almonds, and there are manufactures of gold and silver ware, carpets, pottery, armour, and matches. A feature of the city is the fine bridge across the river Zendeh Rud. Pop. 205,000.

Israel. Jewish state proclaimed May 14, 1948. See N.V.

Israel (Heb., perseverer 'with God'). Name given by God to Jacob (Gen. 32 and 35). It became an appellation in the term "children of Israel" (or Israelites), i.e. the twelve tribes descended from

the sons of Jacob. With the virtual disappearance of the other tribes it was used loosely to denote only that of Judah. See British Israel World Federation.

Israel in Egypt.

Oratorio by Handel. Composed in 1738, and first performed April 4, 1739, it is notable for its vigorous and dramatic choruses, of which those relating to the plagues are best known. Prob-

ably the composer himself selected the words. This oratorio was not performed in Germany until 1831.

Israels, JOSEF (1824–1911). A Dutch painter. Born at Groningen, Jan. 27, 1824, he studied under



Josef Israels, Dutch painter

Kruseman in Amsterdam, and later in Paris. In 1855 he exhibited at the Salon The Prince of Orange opposing the Decrees of the King of Spain. A distinguished painter in genre, he found his subjects among fisher-folk and peasants. Among his best known pictures are *Evening on the Shore*, *Happy Old Age*, *The Eve of Separation*, *The Ship*, *The Sleepers*, *The Cobblers' Repast*, *Alone in the World*, *Interior of the Orphan Asylum at Katwijk*. He was also



Israels. *The Anxious Family*, by Josef Israels, an example of this artist's 19th century expression of that love of domestic subjects which inspired so many of his predecessors in the Dutch school

From a private collection

an excellent portraitist. He died at The Hague, Aug. 10, 1911.

Israfil. One of the four principal angels of Mahomedanism. His office will be to sound the trumpet at the resurrection.

Issik-Kul. A lake of Central Asia, in Kirghiz S.S.R. Its area is 2,300 sq. m. and depth 1,400 ft. Now a closed basin, and constantly diminishing, it once communicated with the river Chui. The water is brackish and unfit to drink; the banks are haunted by tigers and wild boars. The name means warm lake. Karakol stands at the E. end. Issik-Kulsk is the name of a region of the republic.

Issoire. A town of France, in the department of Puy de Dôme. It stands on the Couse, a small tributary of the Allier, 30 m. S.S.E. of Clermont Ferrand. An old town, its chief building is the 12th cent. Romanesque church of S. Paul. The industries include brewing and trade in agricultural products and fruit.

Issoudun. Town of France, in the dept. of Indre. It lies on the river Théols, 17 m. by rly. N.E. of Châteauroux, on the route to Bourges. The town is a subprefecture of the dept., and is chiefly industrial, with leather works and breweries, but is also an agricultural and vine-growing centre. The 15th cent. church of S. Cyr has a notable E. window in late decorated style, and in the garden of the hôtel de ville is the Tour Blanche, 12th century. It was the Roman Exoldunum. Pop. 12,645.

Issue (Lat. *ex*, out; *ire*, to go). Word meaning something that arises from something else. In law it is used both for descendants and for the end of anything, e.g. the issue of a trial or contest. In the former sense it is frequently used in reference to property, especially in wills and bequests. In a lawsuit, issue means strictly the matter to be tried. Thus if A sues B for £100 money lent, and B denies the loan, the issue is whether A lent B £100. But if B admits the loan, and alleges that he repaid it, the issue is whether B repaid A.

Issus. Ancient port of Cilicia. It stood on the gulf now called that of Iskanderun, or Alexandretta, and is celebrated for the battle fought in a defile near by in 333 B.C., between Alexander the Great and Darius III, the latter being totally defeated. Near here also Septimius Severus defeated Pescennius Niger in A.D. 194, and Heraclius overcame the Persians under Chosroes in 622.

Issy OR ISSY-LES-MOULINEAUX. S.W. suburb of Paris, in the dept. of Seine. It lies on the left bank of the Seine, just outside the fortifications, and is contiguous with Vanves on the E. It is connected with Paris by electric rly., and there are steamboat landing places on the river bank. The Fort d'Issy forms part of the system of fortifications of the capital. Industries include a state tobacco manufactory. Pop. 42,449.

Istanbul (Gr. *Constantinople*, Ital. *Cospoli*). Chief city and port of Turkey, and the capital until 1923, when a new capital was set up at Ankara. Istanbul gives its name to a vilayet, 2,120 sq. m. in area, with a pop. of 1,074,091. The city (pop. 845,316) is situated picturesquely on both sides of the South end of the Bosphorus, its nucleus being the district on the Golden Horn, an inlet of the Bosphorus 4 m. long, and up to 130 ft. deep, crossed by two bridges. On the peninsula formed by it and the Marmara Sea is situated old Stambul, with the remnants of old Byzantium: the Hagia Sophia cathedral, since 1453 the main mosque; the Atmeidan—the ancient hippodrome—with the old Greek "burnt column," the obelisk of Theodosius (A.D. 390) and the column of Constantine; a number of churches built 300–1400; and the old walls of the city built by Theodosius in the 4th cent., with 27 gates. There, too, are situated the main Turkish buildings: the Suleimaniye mosque (1550–66), the most beautiful Ottoman building; the Bajazid (1497–1505), Ahmed (1608–14), Selimje (1520–23), and other mos-

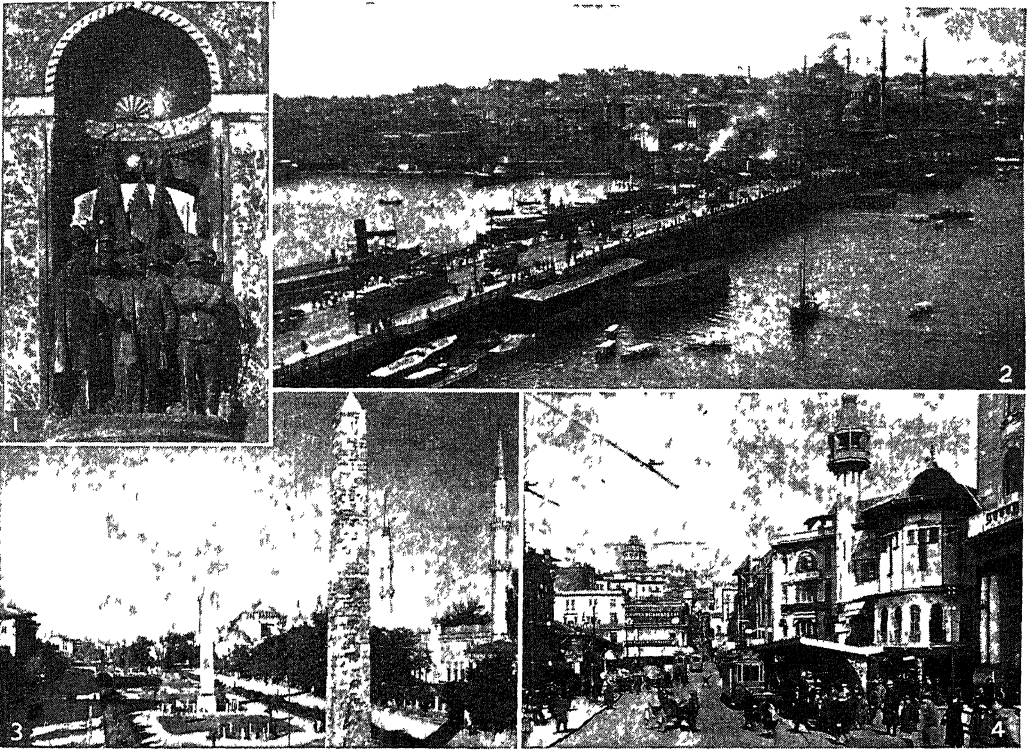
ques; the Soliman mausoleum, and the old bazaar, a huge labyrinth of covered shopping lanes built 1461 and several times renovated; the Seraskierate (former war office) with a tower 400 ft. high; the Top-Kapu Serai, former palace of the sultans, includes the buildings of the sublime porte, the Ottoman government.

Istanbul's other quarters mostly preserve a specific racial or national character: Galata, N.E. of the Golden Horn and rising to some height, is the district of the "Frenks," i.e. the foreigners; the adjoining Pera that of Western Europeans, formerly of the embassies; W. of Pera is Kassim-Pascha, essentially Turkish and possessing many old timber-frame buildings with balconies and projecting alcoves; there the naval institutions predominate. N. of it lie the Greek suburb of S. Dimitri, and the Jewish one of Chaskoi; in other areas are concentrations of Armenians, Russians, etc.; and on the Asiatic side of the Bosphorus is the suburb of Scutari, where the Anatolian and Bagdad rlys. start, and where one of the largest cemeteries in the world attracts visitors. Another cemetery, about 3 m. inland along the Golden Horn, is near the Eyub mosque, a building where relics of the Prophet—sword and flag—attributes of the Sultans' rôle as Caliph, were preserved.

Many of the former court and government buildings, e.g. the palace Dolma Baghtje on the Bosphorus, the Seraskierate, etc., have since 1923 been in the hands of the university and the technical high school, and are used as museums.



Istanbul, Turkey. Plan of this Ottoman city on the Bosphorus



Istanbul, Turkey. 1. Monument to Mustapha Kemal, in Taksim Square, Pera. 2. The Galata bridge, looking towards old Stambul. 3. The Atmeidan, covering the site of the Hippodrome; the masonry pillar in the foreground was once covered with bronze plates, but its origin is unknown; beyond it is the surviving fragment of a bronze serpent pillar brought from Delphi by Constantine; beyond that again, the obelisk of Thothmes III, brought from Heliopolis by Theodosius; in the background is S. Sophia. 4. Tram terminus at the Pera end of the Galata bridge. See also S. Sophia illus.

Without industries of importance Istanbul exports furs and skins, mohair and wool, silk, figs, tobacco, etc., and Turkish art-craft products such as carpets and rugs, embroideries, and filigree work. Public institutions include the university, the technical high school, and schools of commerce, art, pharmaceuticals, and veterinary surgery; a museum of antiques, with the beautiful (though probably misnamed) Alexander sarcophagus, a masterpiece of antique sculpture; and an archaeological institute. There are 700 mosques, 172 churches of different denominations, and 40 synagogues; it is the seat of a Greek Orthodox patriarch, a Greek-Bulgarian archbishop, a Bulgarian Orthodox Metropolitan, an Armenian patriarch, a Jewish chief rabbi, and the Sheik-ul-Islam.

Apart from its unique geographical situation and its extremely colourful popular quarters where old oriental manners and houses blend with up-to-date western buildings, ways of life, and comfort, its plane-trees

and its hundreds of stone fountains (*tchechmes*), frequently richly carved, are among Istanbul's most striking attractions. Sanitary conditions have improved since the days of the sultanate. Owing to the maintenance of old and primitive ways—e.g. the use of a Roman water-conduit—they were long unsatisfactory. Nevertheless, Istanbul could boast the greatest number of reputed centenarians of any city in the world.

HISTORY. Constantinople, founded by Constantine the Great in 330 as a new capital for his empire, occupied the site of the Greek city of Byzantium. Constantine desired to make his new city the capital of the whole Roman empire, and with that object seized all the art treasures in the principal cities of Greece for its embellishment.

Whereas Byzantium covered only two hills, Constantine's first city occupied five, two more being included a century after his death, so that Constantinople, like Rome, stood on seven hills. In 413 this enlarged city was surrounded by a high, fortified wall, about 13 m.

in length, as the main defence against the barbarians.

For a thousand years, more fortunate than Rome, Constantinople resisted the Goths and bought off the Huns. Belisarius saved it from the Bulgarians; it withstood the Persians for ten years, and saw Chosroes, the Sassanide, retire baffled from its walls. The famous Caliph Haroun al Raschid was not more successful. Indeed, the city might have claimed impregnability had it not been taken by the Crusaders in 1203 under Baldwin of Flanders. They marred a remarkable military exploit by so ruthlessly sacking the place that many of the choicest specimens of the art of ancient Greece were lost for ever. The Venetians alone showed good taste in carrying off the Horses of Lysippus to decorate S. Mark's, Venice.

The direct consequence of this capture was the establishment of a family of Latin emperors at Constantinople. This, however, ruled only 57 years, and in 1261 the Greek rulers were restored in the person of Michael Palaeologus. A hundred years later the Turks

appeared on the scene, and on May 29, 1453, after a valiant defence, they captured the city. They have remained in possession of it without a break except for its occupation by British, French, and Italian troops after the First Great War, from Nov. 13, 1918 to Oct. 2, 1923.

Edgar Stern-Rubarth, Ph.D.

Isthmia OR ISTHMIAN GAMES. One of the four great athletic festivals of ancient Greece, the others being the Olympic, the Pythian, and the Nemean. The festival was held every two years, in spring and summer alternately, near the isthmus of Corinth in honour of Poseidon, god of the sea. Theseus, legendary king of Athens, was traditionally regarded as the founder of the games at which musical and dramatic as well as athletic contests were held. See Olympic Games.

Isthmus (Gr. *isthmos*). Narrow neck of land either uniting a peninsula to the mainland or joining two continents together. Examples of the first are the isthmuses of Corinth, Kiel, and Kra (Malay Peninsula); of the second, those of Panama and Suez. The cutting of a canal through an isthmus often shortens shipping routes, and there are ship canals through all the above, except that of Kra.

Istria. Peninsula at the head of the Adriatic Sea. The land boundary lies on the slopes of the Karst or Carso mountains overlooking the narrow strip of lowland between Trieste and Fiume. Formerly an Austrian province, it included the Quarnero islands, Veglia, Cherso, etc. It passed to Italy after the First Great War, becoming part of the compartimento of Venezia Giulia. Under the peace treaty with Italy, 1947, Istria was transferred to Yugoslavia except for the W. part as far S. as Cittanuova, which comprised the territory of Trieste.

Istria is 62 m. long, its greatest width is 47 m., and its area 1,913 sq. m. To N. and N.W. the peninsula is mountainous, an outlier of the Eastern Alps, reaching over 4,000 ft. near Laurana, on the Gulf of Fiume. The W. and S. form a lower plateau with a ridge flanking the E. coast and a gentle slope to the W.; here the limestone provides characteristic Karst phenomena. The W. coast has many bays used by fishermen, but too shallow for larger vessels; the harbour of Pola in the S., formerly the Austrian naval port, is an almost landlocked basin extending inland for 2½ m. The Quieto, 32 m.,



Italian Greyhound. Prince Ivanovitch, a prize dog of the breed

is the chief river, while many streams vanish in swallow holes. Rain falls in spring and autumn when the sirocco blows; the bora and other winds are dry. Maize and wheat are the chief cereals, while vines, olives, and mulberries are grown. Fishing is important.

The pop. is a mixture of Italians, Croats, and Slovenes. Pola (*q.v.*) was, under the Italians, the largest town, while Pisino was a former capital. Rovigno is a flourishing small port. The rly. system is a relic of Austrian strategy. One line goes S.E. from Trieste to Fiume; another goes S. to Pisino, a great road centre, and Pola, with a branch to Rovigno. See Italy; Trieste; Yugoslavia.

Itacolumite. Yellow sandstone rock chiefly composed of quartz, but containing also mica, talc, chlorite, etc. Found extensively in Brazil, it has the remarkable property of being flexible when cut into thin sheets. The sheets or plates can be bent backwards and forwards to such a degree as to give the rock the alternative name of flexible sandstone. The rock is one of the sources of Brazilian diamonds.

Itagaki, TAISUKE, COUNT (1837-1919). Japanese statesman. He served with the emperor's troops in the insurrection of 1868, and became an ardent imperialist. He held cabinet office in 1871-73, but resigned and founded a school of liberalism which earned him the name of the Japanese Rousseau. A student of Western political systems, he was a member of governments in 1878 and 1880, and as leader of the constitutional party, founded by himself, became minister for home affairs in 1898. In 1900 he retired from public life. He had been ennobled in 1887, and was converted to Christianity. He died July 23, 1919.

Itajahy. Seaport of Brazil, in the state of Santa Catarina. It stands near the mouth of the river

Itajahy, 56 m. N. of Florianopolis, and was the port of the German settlement of Blumenau. The river empties into the Atlantic Ocean just below. Exports are timber and minerals. Pop. 8,000.

Italian Greyhound. Small breed of toy dog, closely resembling a diminutive greyhound. The average weight of a specimen is about 7 lb., and the favourite colour a golden fawn. The breed, which comes from Italy, and dates from the beginning of the 15th century, has speed but is too delicate for sporting use.

Italian Sixth. In music, a chromatic chord consisting of a bass note with a major third and augmented sixth above it, thus: It belongs essentially to the key of its middle note—in this example C, but can be used also in other keys. The origin of the name is uncertain. See Harmony; Interval.



Italic (Lat. *italicus*). In printing, a type, the letters of which slope up towards the right, as in the Latin word at the beginning of this paragraph. Originally called Aldine or Venetian, and known also as cursive, it was first used in an edition of Virgil printed at Venice in 1521 by Aldus Manutius (*q.v.*), and dedicated by him to the Italian states. It is said to have been made from an imitation of the handwriting of Petrarch made by an engraver, Francisco da Bologna. Its introduction has been attributed to a desire, by economy of space, to avoid the repetition of contractions, and as first used the capital letters were upright, as in ordinary type. It was adopted in France in 1521, in England in 1524. In the Bible its use is restricted to words introduced to make the sense clearer. At one time prefaces to books and all proper names were printed in italic. Later usage is for emphasis, foreign words, side-headings, cross-headings, and to distinguish names of books, newspapers, periodicals, ships, etc., a practice that is becoming more and more restricted with a view to giving a type-page a neater and more uniform appearance. In MS. for the printers, words to be in italic are underlined.

In another sense the word Italic means of or pertaining to ancient Italy or its people. It is also applied to an order of architecture—the Composite; and to the Pythagorean and Eleatic schools of philosophy. See Printing; Typography.

ITALY: ITS HISTORY, LITERATURE, AND ART

C. M. FRANZERO, Writer on Italian Affairs, and JULIA CARTWRIGHT

The story of Italy, centre of the Mediterranean, is here told from the end of Rome's empire to the Peace Treaty of 1947 (for later, see N.V.). An account of Italy's literature and unsurpassed art follows. See Rome. See also East Africa Campaign; Fascism; Italy, Campaign in, 1943-45; North Africa Campaigns, etc.; articles on the cities and towns, and on such famous Italians as Annunzio, G. d'; Cavour; Dante; Garibaldi; Mazzini; Medici; Mussolini; Sforza

Italy's geographical confines are marked by the three seas, Tyrrhenian, Ionian, and Adriatic, and by the arch of the Alps. By the peace treaty of 1947, her former W. frontier with France was slightly modified in France's favour, her E. frontier was changed to create the free territory of Trieste, the part of the former Venezia Giulia E. of that territory going to Yugoslavia. Within these new boundaries, Italy has an area of about 116,000 sq. m., compared with 119,733 sq. m. before the Second Great War.

The geographical position of Italy is noteworthy. The peninsula projects into the middle of the Mediterranean basin, with Sicily less than 100 m. from the N. African coast, and Messina roughly equidistant from Gibraltar, Suez, and Odessa. This geographical position has made Italy an intermediate land between Europe and Africa as well as between W. Europe and the Near East.

Varied Geological Formations

Geologically, Italy is a younger land than the Iberian peninsula, presenting a great variety of tectonic phenomena, although the crystal strata which abound in the W. Alps and in the Calabro-Sicilian region are often mistakenly considered to belong to the archaic period. By the conformation of the land, and the variety of its landscape and geological nature, Italy is divided into three parts, the Alpine region, the Lombard or Po region, and the peninsular or Apennine region. The Alpine region in itself is very varied. It includes great deep valleys with steep flanks, often terraced, and due to ice-modelling of the Quaternary period. These valleys have had great importance in relation to the settlement of human communities and the development of cultivation and communications. The greater valleys lead into the pre-Alpine zone, which, especially in the Lombard and Venetian regions, is divided from the Alps proper by a series of well-defined, longitudinal lesser valleys. Below the pre-Alps is a sub-Alpine zone, of softly undulating hills which, geologically, are the tail-end of the great peripheral tongues of the ice period. Often these hill ranges enclose large and deep lakes, e.g.

Maggiore, Como, Garda. The variety and richness of vegetation in these parts, in particular the mulberry, have contributed to the development of flourishing industries. Lower still lies the vast northern plain or Po valley. The Apennines traverse the whole of the peninsula, running southward from the Ligurian region to the "toe" of the "boot." The Sicilian mts. also are in part of Apennine type. The island of Sardinia has a different structure, belonging, like Corsica, to a formerly submerged land.

The mt. ranges and geological conformation of Italy have created many rivers, the most important of which are the Adige, the Po, the Arno, and the Tiber; none, however, except in part, is suitable for navigation. Many of the smaller rivers dry up in the hot summers.

The climate differs considerably from N. to S. The Alps of Bergamo lie on the 46th parallel, while the 38th cuts the southernmost part of the peninsula. The climate of the N. is Continental in character while that of the peninsular section is Mediterranean. The rainfall is about 30 ins. on the lowlands and 50 ins. or more on the hills and mts. The N. and the mts. of the peninsula have heavy snowfalls; many parts of the Italian Alps show perpetual snow. Italy also has several active volcanoes, viz.: Vesuvius (c. 4,000 ft.) overlooking the bay of Naples, Etna (10,755 ft.) in Sicily, and Stromboli (3,040 ft.) on an island of the same name in the Tyrrhenian sea.

Fauna of the Peninsula

The fauna is rich and varied. On the Alps and occasionally in the Abruzzi mts. can still be found ibex (*Capra ibex*) and chamois (*Rupicapra rupicapra*). The stag, rare, is found on the E. Alps; characteristic of Sardinia are deer (*Dama dama*) and mouflon (*Ovis musimon*). There are many boars, especially in Sardinia; and bears can still be found in Abruzzi. Wolves exist in the central and southern Apennines, and in Sicily. In the Alps ermine are found, and many birds, occasionally eagles.

Italy is divided into 19 regions, 91 provs., and has 7,681 towns.

The total pop. (1948) was 46,110,000 or c. 400 to the sq. m. Three cities have (1948) more than one million pop., Rome (1,597,000), Milan (1,268,000), and Naples (1,015,000). The people, though Mediterranean in character, show influences of many migrations which crossed Italy from N. to S. and E. to W.

Vegetable and Mineral Products

Agriculture is the basis of Italy's economic life; 49.4 p.c. of the soil is cultivated, 20 p.c. is natural pasture, 13 p.c. is covered by woods. According to the agrarian census of 1930, 8,810,000 persons were occupied solely in the cultivation of the soil. Nevertheless, the wheat grown in Italy does not suffice for the needs of the country. Other important products are maize and the vine, from the grapes of which excellent and varied types of wine are made. Flax and hemp are grown, some cotton and tobacco.

Italy's mineral products are of secondary importance, the most noteworthy being sulphur in Sicily, formerly the largest output in the world and still some 220,000 tons yearly; and mercury in Tuscany (2,575 tons yearly), the largest output in the world. The only coal is a poor kind of lignite. This explains the great development, especially in the N., of hydro-electric power: in the first nine months of 1946, of the total power generated (11,298 millions kW.), 10,834 million kW. was derived from hydro-electric plants. Other mineral products are graphite; marble, of which there is great variety, beginning with the white marble of Carrara, the exploitation of which constitutes a flourishing industry; and sea salt, obtained from seven active salt-beds (650,000 tons), the biggest of which is at Cagliari in Sardinia, others being in Puglia and Sicily. There are several sources of mineral waters (San Pellegrino, Finggi, etc.) and hot medicinal springs occur at Salsomaggiore, Montecatini, Agnano, Albano, etc.

Industry developed greatly after 1920 in every aspect of manufacture, from ship, motor car, and aeroplane building to the production of silk, textiles, and furniture.

In 1942 Italy produced 1,898,763 tons of ingot steel, 873,049 tons of pig-iron. The biggest industries are nearly all in the N. Among minor industries are the glass of Murano and the lace of Burano, both in Venice, and the pottery of Florence and Rome. Food is canned in Naples; and important areas of wine production, almost all for home consumption, are Tuscany (Chianti), Piedmont, and Sicily.

Italy's trade in the 1930s was considerable, though low on a *per capita* basis. Her imports normally exceeded her exports, the difference being covered in large part by shipping services, the tourist industry, and remittances from Italians abroad. Her chief imports were coal, petroleum, iron ore, and steel scrap.

On June 30, 1946, the state rlys. were 9,410 m. long, of which 2,475 m. were electrified. (The rlys. measured 14,446 m. in 1942, 10,664 m. state owned.) The roads exceed 126,000 m. in length, of which 13,324 are state roads; some 320 m. are reserved for motor traffic. Italy's seagoing merchant fleet in 1946 numbered 123 vessels of a total tonnage of 691,700 tons (compared with 667 vessels of 3,910,800 tons before the Second Great War). The chief ports are Naples, Genoa, Venice, Leghorn, and Messina.

CONSTITUTION. As a result of a special referendum held on June 2, 1946, Italy became, June 10, a republic. A constituent assembly, elected by proportional representation also on June 2, 1946, consisted of 556 members and, pending the completion of a new constitution, remained the governing body of the republic.

From 1861 until the fascist revolution of 1923 (*v.i.* History), Italy was a limited monarchy, the king reigning without governing and sharing the legislative power with a parliament composed of an elective chamber and a senate consisting of princes of the blood and an unlimited number of others over 40 years of age who had qualified under any one of 21 categories. On Dec. 9, 1928, the Fascist grand council was formed: it stood above parliament, and even above the crown, since it took upon itself the right of veto in regard to the succession to the throne. In 1938, the chamber of deputies was transformed into a chamber of corporations. Both the fascist and pre-fascist constitutions disappeared with the fall of Mussolini and the defeat of Italy.

EDUCATION. The level of education is, on the whole, high, although illiteracy still exists, especially in the S. There are elementary, secondary, and high schools, universities and professional (agricultural, commercial, naval, industrial) and art schools. Education is state controlled throughout, and the curriculum is standardised for the whole country. A few private schools exist, but students must pass examinations at the state schools before they pass from one grade of school to another or to a university. Elementary education is free and compulsory from 6 to 11. Higher schools charge low fees, and exemption from payment can be secured by needy or promising students. Of Italy's 21 universities, ten are entirely supported by the state.

COLONIAL EMPIRE. At the beginning of the Second Great War, Italy's colonial possessions were as shown in the table.

	Area sq. m.	Pop. (approx.)
Eritrea	15,754	600,000 (4,000 Europeans)
Somaliland	194,000	1,021,000 (1,670 Europeans)
Libya	213,876	705,000 (50,000 Europeans)
Abyssinia	350,000	8,000,000 (34,000 Europeans)

The Italian empire also included the Dodecanese (*q.v.*), ceded to Greece under the peace treaty, 1947, and Albania, liberated in 1944. Abyssinia, reconquered by British Imperial forces, resumed its status as an independent state in 1941. Eritrea, Somaliland, and Libya remained after the Second Great War under British military administration pending a decision as to their disposal which, under the peace treaty, had to be made within a year of the date of the treaty's coming into effect (*i.e.* by Sept. 16, 1948.) *See* N.V.

HISTORY. During twelve centuries of Roman domination, Italy underwent a long phase of development, reflecting the glory and the decadence of the Roman state. Both before and under Rome, however, Italy was a conglomeration of different peoples, some of whom had attained a considerable cultural level. Among them were the Etruscans (whose writing has remained undeciphered); the peoples of Magna Grecia and Sicily who had absorbed, and retained, Greek culture; the Gauls of the Po basin and the Venetians of the N.E. Rome succeeded in latinising the whole administratively, but not politically. The result was that Italy, which had, through Rome, created

the Roman empire, was in the end the weakest member of it. With the end of the empire, Italy started a new phase of her history.

When, in the middle of the 5th century, Gaul and the Iberian peninsula fell under the occupation of Goths, Visigoths, and Franks, the Roman, or Western, empire survived only in Italy where it had been born. But during the course of that century the peninsula itself was invaded by barbarians; Rome being several times sacked by them. For more than a century the emperors held the throne under the protection of barbarians, until Odoacer, who had come to Italy across the N.E. Alps, in 476 promised a distribution of land to the barbarian troops who had been in the Po valley for more than two generations, and was elected emperor, thus turning out of Ravenna the last of the Western Roman emperors, Romulus Augustulus. The year 476 marks both

the advent of barbarian rule over Italy, and the restriction to the peninsula of the name Italy, the Italian prefecture having previously comprised also the African dependencies and those of Illyria on the Adriatic. Odoacer became king of Italy, with Sicily and Dalmatia.

The effects of the invasion of Theodoric with his Ostrogoths, at the end of the century, went much deeper. Theodoric divided among the *hospites*, *i.e.* his troops, a third of the land, which he took from its native possessors; but the Goths kept for themselves only the profession of arms, and left civil administration to the Romans and Italians. This phase lasted until 553, when the war of imperial reconquest was started by the emperor Justinian, the Gothic reign ended, and Italy became a province, but not the centre, of the Eastern Roman empire. After 568 N. Italy was invaded by the Lombards, or Langobardi, with their king Alboin, already settled in Hungary. Unlike the friendly Goths, the Lombards came into Italy as foes and conquerors. They advanced rapidly as far S. as Benevento, and Italy was divided into a loosely knit confederation of duchies, from Milan to Naples and Benevento, with Pavia as capital.



Italy. Map of the republic, showing the boundaries as defined by the peace treaty of 1947

The peoples of Italy, meanwhile, were beginning to develop an autonomous political administration under the *suave iugum* (kindly rule) of the bishops, among whom the bishop of Rome soon took precedence: he was a spiritual chief whose position was strengthened by the support of the militias of Rome and Ravenna, and the ships of Venice. On the W. frontiers of the Lombard kingdom lay the Frankish kingdom. More than once, Franks and empire linked hands against the Lombard king-

dom. It was natural, therefore, that the church should turn to them. Pope Gregorius III wrote to Charles Martel in 739. Charles did not answer. But his son Pepin the Short recovered the papal territories seized by the Lombards and returned them to the church. The pope crowned Pepin in Rome, and placed the liberated territories of the church under his protection. In this restitution, 756, called the donation of Pepin, not in the apocryphal donation of Constantine, the papal state was histori-

cally recognized. It was to last until 1870, and its survival is embodied in the symbolic Vatican city.

In 774, with the Franks finally ruling in Italy in place of the Lombards (who, however, left their name to the region ever since called Lombardy), Italy was finally detached from the E., and the Roman church emerged as a paramount power in Europe. In S. Italy there still survived a remnant of Greek culture. Concurrently with this personal union between the Frankish

kingdoms in France and in Italy, the peninsula was newly infiltrated by Frankish and German elements—Alamans, Burgundians, Bavarians, etc.—who brought Italy into touch with Germany and the Anglo-Saxon countries. A new and vaster world opened to Italy, and it was a Western world. When Charlemagne recreated a great empire, his position in the eyes of the church was very great indeed, and solidarity between the new empire and the papacy developed.

Dawn of the Renaissance

It was really at this stage that the Renaissance, not only religious but secular and cultural, started: men of culture turned their eyes to the new political star, and began to envisage a change from the disorder of barbaric invasions to an era of culture and the liberal arts—a return to the classic world. On Christmas night of the year 800 this spiritual fusion with the new Western empire found expression in the crowning of Charlemagne as Roman emperor by Leo III before the altar of S. Peter in Rome.

At the death of Charlemagne, in 814, Italy was a kingdom of Lombards under a Frankish dynasty, with here and there traces of former Greek domains in Sicily, and a Roman republic in the papal territories; plus the duchies of Benevento, Venice, and Naples. The first part of the Frankish possessions in Italy to detach itself was Sicily, which in 827 fell under Arab domination. But a new western civilization, spreading from Spain to Syria, was approaching S. Italy. The Carolingian dynasty was losing prestige, and it was the pope who undertook to rescue the S. from the Moors. The church, too, asserted its independence, within and without Italy, dictating laws and imposing terms on crowned heads and mere aspirers to crowns alike: thus, in 876, the pope persuaded Charles the Bold to renounce his claim to Rome. The pope came more and more to take the place of the king in the troubled S., defending it against both the Saracens and the dukes of Spoleto. From Bari the forces of Byzantium were also advancing against the Saracens.

The first half of the 10th cent. saw the consolidation of the church's prestige, and its emergence as an international power. In 951, Otto I, king of Germany, was called into Italy by Adelaide, widow of Lothair, king of Italy, who had taken refuge with the bishop of Reggio, in N. Italy.

Otto entered Pavia, the old capital, without a fight, married Adelaide, and took the title of king of Lombardy, assigning Lombardy, however, to his son Adalbert, less the margravates of Verona and Aquileia, which he gave to his brother Henry, duke of Bavaria and Carinthia. There followed a short struggle between pope and emperor, which ended in the emperor's triumph, Italy changing from a Frankish to a German kingdom. For Otto I, the city of his own heart was not Rome, but Aquisgrana (Aix-la-Chapelle), where Charlemagne, symbol of the new empire, was buried. When Otto, therefore, revived the empire, in 962, it was Charlemagne's empire that he had in mind. Rome had to submit to the empire, although the emperor recognized that Rome remained *caput mundi*. German influence increased all through the 10th century, and Otto III thought, at one time, of making Rome the seat of the empire once more. This close association of emperor and church, drawn together by their mutual interests, marked the apex of that process through which the bishops came to exercise high political functions.

Revolts of the Aristocracy

The 11th cent. brought revolt against this order, headed by the secular aristocracy. In 1001 there were insurrections in Rome, Tuscany, and Piedmont. These risings took on a national colour; they were called Roman, Italian risings against the foreigner. Arduino, marquess of Ivrea in Piedmont, was elected king of Italy by his peers at Pavia. But from Germany came Henry II, of the same Saxon family; he was well received in N. Italy, and the archbishop of Milan crowned him king (1004). There was a revolt, and the king was obliged to flee. But he returned and confirmed the bishops in their temporal power. Never again, until the 19th cent. was there a king of Italy of Italian origin. Italy was a fief of the empire, with the church holding the balance between the German emperor and the local dukes. But the Moorish invaders had been finally expelled from the S.

By the beginning of the 11th cent., Pisa's ships were trading in the southern seas. Pisa and Genoa were extending their military and mercantile power over Liguria and Tuscany, an extension of power that was eventually to bind Corsica and Sardinia to the peninsula, and that, on the Adriatic, was soon to be rivalled

by the power of Venice. Development of the cities of the S. followed, and soon Salerno and Amalfi became famous in culture and law. At the same time there was rivalry between the German, Angevin, and Norman princes for the control of S. Italy. The secular lords offered the crown first to Robert of Anjou and then to William of Aquitaine, in opposition to Conrad of Franconia, who was supported by the bishops. The long feud ended with the Normans established in the S.

Emergence of City States

This was also the period of the struggle over investiture (*q.v.*) between the austere and firebrand Pope Gregory VII and the German emperor Henry IV. This disturbed situation was particularly favourable to the cities; siding now with the pope, now with the emperor, they took advantages from both. The cities became units, their social and civic composition taking shape in new and independent forms. Wars broke out between cities, and alliances were formed among them—for instance, against the emperor. They had their own coins and currency; they constructed new and much enlarged walls, and built great and splendid cathedrals as centres not only of religion, but also of culture.

Small traders improved their conditions and their position through services rendered to the church or the local lord; the castles guarded the countryside for the benefit of both lord and tenant; and between lord and peasantry there developed contractual privileges and grants of freedom which gave much impetus to social life, so that around the castles there grew up little towns with a complete social structure copied from that of the big cities. The cities themselves became centres of political life, and behind their minor nobility and functionaries, the bourgeoisie, already looking to the new activities of trade and industry, grew steadily in wealth and power.

The records of Milan contain the first mention, 1093, of a *commune consilium*. The beginning of the next century saw the wider establishment of such communes, the concluding phase in a long politico-social and economic evolution, a conception remote from feudalism, essentially a voluntary association, and giving the citizen, whatever his class or trade, a part in the life of his city. Public and private law developed; the



1. Peasant girl from Bellagio. 2. Making macaroni, then dead. 4. Peasant child. 5. Wine cart of the Roman campagna. 6. Factory girl from Leghorn. 7. Peasant woman of the south. 8. Sicilian fishermen. 9. Neapolitan macaroni vendors. 10. Church beadle

ITALY: FAMILIAR SCENES AND FIGURES IN THE SOUTH EUROPEAN REPUBLIC

new bourgeoisie of *mercatores* (tradesmen) was recognized; the crafts organized themselves into protective guilds. The cities became models of civic and cultural life, with an enduring influence upon the duchies.

While the former realm of the emperors was transforming itself into municipalities, and the S. was taking a monarchical form of its own, moral unity was growing, its most powerful elements being unity of religion and of culture. Also a new tongue called Romanic or *vulgaris* was becoming the spoken language of the peninsula, even permeating the degenerating Latin of official documents. A new Romanic—or Italian—architecture was flourishing in places as far apart and as different as Lombardy and Apulia. Roman law returned to life and became an object of study. There was a revival of interest in the monuments of the past; the Renaissance was breaking down barriers between states and carrying Italian culture all over Europe.

Political events seemed to lose coherence. There were vivid episodes, such as the *Carroccio* or Lombard league which at the battle of Legnano, 1176, defeated the emperor Frederick Barbarossa who, seven years later at the peace of Constance, relinquished all but nominal rights of sovereignty over the confederate cities. The cities became, in fact, states on their own, recognized by king and pope, with their own ambassadors. Then, too, the great ducal houses of Italy arose—the Sforzas of Milan, the Estes of Mantua, the Montefeltros of Urbino, the Savoy of Turin, the Medicis of Florence—each an autonomous unit, and yet all intermingled in the wider struggle of the time for control of Italy, the needle of the balance in the Mediterranean.

Guelphs and Ghibellines

Dominating the period was the rivalry of Guelphs and Ghibellines (*q.v.*), of which Dante, himself a Ghibelline or imperialist, spoke with such bitterness in his *Divina Commedia*. This desperate struggle was for the ascendancy of papacy or empire over Italy. The republican cities and the duchies took sides, prompted most often by considerations of interest; and for more than two centuries war ravaged Italy. Yet during those two and a half centuries Italian art and culture touched their unsurpassed peak.

After the death of Frederick II (1250) and of his son Conrad IV

(1254) the imperial cause was sustained in S. Italy by Manfred, acting as regent for the boy Conradin, the picturesque Corradino di Svevia. Popes Innocent IV and Alexander IV continued to make headway against the Ghibelline party, which made itself odious by the massacre ordered by the tyrant of Padua, Ezzelino da Romano, himself killed in 1259. The Guelphs gained ground in Lombardy; but the Ghibellines in Tuscany recovered after the battle of Montaperti (1260) which placed Florence in their power. At this, Pope Urban IV (d. 1264) invited Charles of Anjou, brother of the king of France, to Italy, to command the Guelphs, and be crowned king of Sicily. Charles accepted, receiving the support of pope Clement IV when he succeeded Urban, and defeated Manfred in 1266. When Conradin, a boy of 16, came from Germany in 1267 to claim the succession, he was defeated at Tagliacozzo, 1268, captured, and beheaded at Naples.

The Sicilian Vespers

The pope was thus victorious; but Charles of Anjou had achieved a power in Italy which excited the pope's jealousy. A Sicilian rising against the French began with the massacre of March 30, 1282, called the Sicilian Vespers, and the Norman line was restored in the house of Aragon, Manfred's daughter having married Don Pedro, king of Aragon. The Angevins continued to reign at Naples. The new emperor, Rudolf of Hapsburg, thought it wiser to make a deal with the popes, and by a charter of 1278 confirmed the papal sovereignty over Emilia, Romagna, the mark of Ancona, the old patrimony of S. Peter, and the campagna of Rome. The Guelphs were now in the saddle in Italy: but the Mediterranean remained a field for the rivalry of Genoa and Venice.

It was in this period of continuous strife that, after the election of a Frenchman as Clement V, the popes moved in 1309 to Avignon, coming thus into the power of the French kings and losing their authority in Italy. In 1309 Robert of Anjou, grandson of Charles, became king of Naples and leader of the Guelphs. Henry VII of Luxemburg (symbolised by Dante in his *De Monarchia*) entered Italy in 1310, was crowned in Rome, but died at Buonconvento, near Siena, in 1313. His death was followed by great confusion and rivalries between local potentates in central and N. Italy.

The middle of the 14th century saw the advent of mercenary armies, companies of adventurers who sold their services to the highest bidder. At first composed mainly of foreigners, such bands were later formed of Italians trained by Alberico da Barbiano, founder of the Milanese house of Belgioioso. Francesco Sforza and Giovanni de' Medici were notable captains of these bands.

Between 1309 and 1447, when the papacy was re-established firmly and without dispute in Rome by Nicholas V, the Italians attained, albeit amidst much confusion and strife, a greater measure of self-government than ever before. By the middle of the 15th cent. Italy was divided into five principal states—the kingdom of Naples, the duchy of Milan, the republics of Florence and Venice, and the papacy. The conflict between Guelphs and Ghibellines had become substantially a social conflict between the new civic and the old feudal institutions, the new commercial and the old military interests, the Guelph representing democracy and industry wisely fostered by the church, the Ghibelline, aristocracy of the old order. Some of the "tyrants" grew stronger and more famous, but on the whole the victory was with the plebians, the older noble families dying out and new houses rising to importance.

Rule by Great Nobles

The Visconti made themselves supreme in Lombardy, Giangaleazzo Visconti in 1395 paying the emperor Wenceslaus 100,000 gold crowns to recognize him as independent and create him duke of Milan. They were succeeded in 1447 by the Sforzas, the great condottiere Francesco Sforza, an advocate of a confederated Italy, proving a good ruler. In Florence the Medici, supported by the common people from whom they themselves sprang, achieved political power through wise use of their riches. Lorenzo the Magnificent, who sought to give Florence equality of power and status with Milan and Naples, made his city also a centre of the new culture.

The Venetian republic emerged successfully from a terrible struggle with Genoa for the lucrative Levant trade; in 50 years, chiefly under the Doge Francesco Foscari and with the aid of great condottieri like the Gattamelata, Francesco Sforza, and Bartolommeo Colleoni, she annexed eleven provinces on the mainland. In Piedmont, the house of Savoy gov-

crned with moderation, backing now the emperor, now the king of France, and enlarging the duchy, which lay astride the Alps and stretched out towards the Po.

Around these greater houses and states flourished many smaller houses, often related by marriage to the greater ones and owing allegiance to them or to the pope.

The quattrocento, as the 15th cent. is called in Italy, was a period of social construction, upon an unstable base continuously shaken by wars, and a period of marvellous cultural development. The spirit of the age was utterly materialistic, a constant calculation of circumstances and opportunities, of ruthless individualism. The *Rinascimento*, artistically, culturally, and socially, was the assertion of individuality: condottieri, dukes, popes, artists, poets, friars. The republics, the states, the duchies, vied with one another in an effort to become seats of culture, to secure the services of the greatest and most celebrated artists. It begins with Dante, Boccaccio, and Petrarch, in the 14th cent. In the 15th and 16th come Machiavelli and Tasso; Leonardo, Raphael, Michelangelo, Titian; Lorenzo the Magnificent, the Borgia popes and Pope Leo X, Francesco Sforza, Isabella d'Este, the exquisite court of Urbino, and Savonarola, the reforming friar. It is the period of humanism and of high thinking; of unsurpassed artistry in painting and sculpture; and of scientific progress. Italian universities attained great fame. Italy became teacher of law, and diffused her culture over Europe.

In 1492 Lorenzo the Magnificent, lord of Florence, died; Columbus discovered America — and destroyed the commercial supremacy of Venice; Rodrigo Borgia was elected pope as Alexander VI. And in the peninsula the stage was set for the disintegration of Italy. Spain, France, Germany had been summoned to protect the small domains of local princelings or states. In Sept., 1494, the invasion began with the crossing of the Alps by Charles VIII of France.

Savonarola, the great Florentine friar (though he was actually born in the N.), welcomed Charles as the messenger of God, although Pope Alexander VI warned the people of Florence that it would be wiser to leave the French in France. Without opposition, Charles crossed Lombardy and Tuscany, where he saw the Medici expelled, and reached Naples, where he was crowned. But the pope and



Italy. Political divisions at the close of the 15th century

Lodovico Sforza were against him, and thus Italy was again convulsed by war. In 1498 Savonarola was put to death for heresy; in the same year Charles VIII died and was succeeded by Louis XII, who, claiming the duchy of Milan through his grandmother Valentina, daughter of Giangaleazzo, seized the city in 1499. Lodovico died a prisoner in France. In 1504, Ferdinand V of Spain ousted Louis XII from Naples.

In Rome Alexander VI, with the help of his son Caesar Borgia, seized Romagna and the March. He died in 1503 and was succeeded by Julius II, a soldierly pope who acquired Emilia and set himself to reduce the power of the local tyrants. He allied himself with the Spaniards against the French, but succeeded only in giving Italy a new foreign master. The fight between French and Spaniards in Lombardy was long; but eventually at the battle of Pavia, 1525, Francis I of France was taken prisoner, and Italy was at the mercy of the Spaniards, who sacked Rome in 1527.

When Emmanuel Philibert succeeded his father as duke of Savoy in 1553 he had no dukedom, but

he took service with his cousin Philip II, and after the treaty of Câteau-Cambrésis, 1559, and the retirement from Piedmont of both Spaniards and French in 1574, he regained his estate, moved his capital from Chambéry beyond the Alps to Turin, and became an Italian prince.

About this time, several of the ancient ducal families in central Italy died out, and the popes settled their domains upon their own relatives. In the S., the Spanish monarchy dwindled to nothing; and during the dynastic wars of Spanish, Austrian, and Polish successions, Italy changed masters with indifference. In 1700 the French armies of Louis XIV were defeated by Prince Eugene of Savoy, who in 1707 expelled them from Italy: and by the treaty of Utrecht, 1713, Victor Amadeus II of Savoy was made king of Sicily — a territory he was forced to exchange for Sardinia in 1720. But Charles of Austria acquired Milan, Mantua, and Naples and Sardinia. Thus began the Austrian domination of the larger part of Italy.

By the treaty of Vienna, 1738, the Two Sicilies were given to the Spanish Bourbon, Don Carlos, and

Lombardy to Francis of Lorraine, husband of Maria Theresa. From that date until Napoleon's invasion of 1796, Italy was at peace. The Savoyis in Piedmont and Sardinia were, for the times, moderate and progressive rulers; in Lombardy, agriculture, education, and order improved under Austrian rule.

Italy was hostile to and alarmed over the French revolution. The tales of the emigrés struck the imagination and, even more, the religious conscience of the Italian people, and it was half a century before they realized that the new creed of political freedom was not mere impiety.

Napoleonic Campaigns

Napoleon's campaign went in phases: in the first, he defeated the king of Sardinia and obliged him to hand over Savoy and Nice; in the second, he defeated the Austrians and signed with them the treaty of Campoformio, 1797, by which Austria gave up Lombardy and received in return the republic of Venice. But after the French occupation of Lombardy (the Cisalpine republic), political movements began all over Italy, whereby Napoleon was able to extend the Cisalpine republic to include the duchy of Modena and the Ligurian republic (capital, Genoa), and to compel Charles Emmanuel IV of Savoy to give up Piedmont to France, 1798. In the same year the temporal power of the popes was overthrown and a Roman republic proclaimed; Naples surrendered and was made capital of the Parthenopæan republic. In 1799 the Bourbon king of Naples was put to flight, and the French took over the duchy of Tuscany. Thus at the end of 1799, with the exception of Venice assigned to Austria, and Sardinia still left to the Savoyis, and Sicily, where King Ferdinand of Naples had taken shelter under British protection, the whole of Italy was under French rule. The pope, Pius VI, died in French captivity at Valence.

The French were defeated at Zürich in 1799 by the Austro-Russian army under Suvarov, and forced to evacuate Naples and central Italy. Even in N. Italy, the French lost ground. But Napoleon, back from Egypt and first consul for life, won back at Marengo, 1800, all that had been lost, and, ignoring his undertaking in the treaty of Lunéville, 1801, to respect the Ligurian and Cisalpine republics, after the proclamation of the French empire (May 18, 1804)

he made himself king of Italy, placing the iron crown of the old Lombard kings upon his own head in Milan cathedral, May 26, 1805. Immediately after, he proceeded to split Italy into a number of principalities, with his relatives as princelings. He appointed his stepson Eugène Beauharnais as viceroy; the republic of Lucca with Piombino he gave to his sister Eliza and her husband Baciocchi; in June, 1805, he declared Genoa an integral part of the French empire; in 1806 he sent his brother Joseph to Naples, where he was proclaimed king (replaced in 1808 by Joachim Murat, Joseph being transferred to Madrid). Napoleon annexed the papal states in 1809: the pope, Pius VII, excommunicated him, only to be arrested and carried to Fontainebleau. The *code Napoleon* was introduced in Rome, which Napoleon meant to make the second capital of his empire.

Fusion of Northern Peoples

The years 1809-12 were years of prosperity for the kingdom of Italy. Milan became an important centre in the national life, and the N. acquired a predominant influence upon political thought and the national conscience. The northern kingdom created by Napoleon fused into one peoples who until then had been divided by political and economic barriers; and gave them a sense of the necessity of bringing the other provinces into a unity. The new French institutions, and the contacts with trans-Alpine countries produced by trade, brought a whiff of fresh air into the musty atmosphere of Italy. The congress of Vienna, 1815, restored to Italy her pre-Napoleonic boundaries except that Austria retained Venice in addition to Lombardy, Friuli, Istria, and Dalmatia, besides having a right to keep garrisons in several duchies granted to vassals of the house of Hapsburg. Italy was ripe for the *Risorgimento*, which had one main problem—to expel Austria.

The social classes that worked in and for the *Risorgimento* were the aristocracy to which the Napoleonic wars and the new intellectual evolution of Europe had given a national conscience; the upper middle-classes and the bourgeoisie which had recently been admitted to the army and public offices. The masses of the people took but a lukewarm part in the movement—after the turmoil of Napoleon's wars, they appeared content to accept a

foreign despotism that gave them peace and protected religion. A group which proved, at the outset, a channel for the fusion of isolated tendencies was the secret organization Carbonaria. Local insurrections began to take place, fomented and organized by the Carbonari. The first was the revolt of Naples, 1820, under General Guglielmo Pepe, which forced the king to grant a constitution, soon revoked, for the Austrians entered Naples in March of the following year and remained there until 1827. But while the Austrians were entering Naples, a revolt broke out in Piedmont, supported by the heir to the throne, Prince Charles Albert. Acting as regent for the absent king, Charles Felix, the prince granted a constitution, promptly suppressed by the king. As a result of plots in Lombardy, the poet Silvio Pellico and others suffered years of imprisonment in the Spielberg fortress: Pellico's *Le Mie Prigioni* excited sympathy all over Europe for his cause.

In 1831, further scattered revolts occurred. The patriots were crushed, but they found a prophet in Giuseppe Mazzini who in 1832 founded Young Italy (*Giovine Italia*) at Marseilles, an association which made familiar the idea of united Italy wherever Italians lived outside their native land. Mazzini, however, was a republican, and another movement took shape whose aim was the unification of Italy under the Savoy dynasty. Vincenzo Gioberti in his *Primato Morale e Civile degli Italiani*, 1843, put forward still another suggestion—a federation of Italian states under the presidency of the pope.

Cavour and Mazzini

The *Risorgimento* took definite shape in 1848. Under pressure from young Count Camillo Cavour, editor of the new and influential *Il Risorgimento*, King Charles Albert of Sardinia on March 4, 1848, drew up a draft constitution providing for a nominated senate and an elected chamber of deputies, the abolition of press censorship, freedom of speech and of meeting. On the 22nd, the five days' revolution in Milan ended in the withdrawal of the Austrians from the city after violent fighting, and next day the king declared war on Austria, in the hope of freeing Lombardy and Venice, only to be defeated after some preliminary success; and on Aug. 6 Radetzky re-entered Milan. Revolt broke out also in the papal states, and the pope fled from Rome, where in

Feb., 1849, a republic was proclaimed, Mazzini becoming head of a triumvirate. In Piedmont, the king again took up arms against Austria, aware that this action was desperate, but that a refusal to go to war would cost him the support of those who sought independence. On March 23, 1849, Radetzky defeated the Piedmontese army at Novaro. The same night King Charles Albert abdicated in favour of his son Victor Emmanuel II, and went into exile, dying at Oporto four months later.

For ten years the Risorgimento appeared to be finished. But that decade was a fruitful period of preparation, politically and diplomatically; its guiding spirit was Cavour. In 1850 Cavour entered the Piedmontese cabinet as minister of agriculture and trade; in 1852 he became prime minister, and until July, 1859, he held the reins of government in that small state, and was the real artificer of united Italy. He saw that the forces of Austria and her vassals could not be defeated without the moral, if not the material, support of the great powers.

The Crimean war gave Cavour his chance. Profiting from Austria's error in displeasing Great Britain and France, he allied Piedmont with them, Jan., 1855, and contributed to the Crimean expedition a force of 15,000 men, which proved most gallant. At the congress of Paris, Feb., 1856, Cavour was delegate for the king of Piedmont and Sardinia, and he took the opportunity of bringing forward the Italian question as of general interest to the peace of Europe, by asserting that Austria was disturbing the political equilibrium by her military occupation of the peninsula, and the incitement that was to revolutionary movements. He secured the sympathy of Gladstone, and alliance with the France of Napoleon III.

Simultaneously, there grew throughout Italy a movement for unity under a monarchy—the Società Nazionale, which had as motto "Italia e Vittorio Emanuele." The speech from the throne in Turin, Jan., 1859, was a clarion call to Italians. On April 23, Austria sent an ultimatum to Piedmont to disarm; six days later war began between Austria and the joint forces of Piedmont and France commanded in person by Victor Emmanuel II and Napoleon III. On June 4 the allies' victory of Magenta freed Lombardy, and four days later



Italy. The political divisions of the country as they existed from 1815 to the unification, which was completed in 1870

Victor Emmanuel and Napoleon entered Milan. At the same moment Garibaldi was freeing Como and had reached Brescia. But Napoleon III decided, without the king's knowledge, to ask for an armistice, and the chance of liberating Venice faded. Against Cavour's advice, Victor Emmanuel accepted the peace terms proposed, and Cavour resigned, to return to office in Jan., 1860, when he exploited the independence movements of central Italy. He agreed to the cession of Savoy and Nice to France as a reward for her help in freeing Lombardy; Tuscany and Romagna were formally annexed to the new kingdom of Italy. A parliament including representatives from central Italy met at Turin in April, 1860.

Meantime, a revolt had broken out in Sicily, at Palermo, Messina, and Catania. Garibaldi accepted an invitation to lead the movement; and on May 5 left Quarto, near Genoa by sea with Nino Bixio (*g.v.*) and a thousand volunteers. Cavour had his doubts about the expedition, sympathizing with its aim, yet fearing diplomatic complications. But Garibaldi landed at Marsala on the

11th, under the protection of British frigates; and on the 27th reached Palermo, proclaiming himself dictator of Sicily in King Victor Emmanuel's name. In Aug., in spite of protests by the powers, Garibaldi crossed the straits, and began to march on Naples. King Francis of Naples sailed for Gaeta on Sept. 6, and next day Garibaldi entered Naples. Cavour, alarmed by French misgivings, decided that Piedmont must take part in liberating the S. He therefore sent Piedmontese troops to occupy Umbria and the March and put themselves between Rome and the Garibaldian legions. Excusing himself on account of the pope's refusal to dismiss foreign levies, Cavour ordered the Piedmontese to cross the papal frontier; and by Oct. 15 they were in Neapolitan territory. On Nov. 7 King Victor Emmanuel reached Naples. Garibaldi gave up his dictatorship and, his suggestion that he should be made viceroy of Naples for life having been refused, he declined other honours and returned to his farm on the island of Caprera.

On Feb. 18, 1861, King Victor Emmanuel II was proclaimed king

of Italy at Turin, by the first parliament representing all Italy. Cavour, who held that Italy would not be fully united until Rome was free and capital of the country, died in June. An attempt by Garibaldi in 1862 to seize Rome was frustrated. In Sept., 1864, however, the French emperor agreed to withdraw his troops from Rome gradually, on condition that no attack was made on papal territories, and that the capital of Italy was moved from Turin to some other city (Florence was chosen) within six months—a move that caused the bitterest feeling in Piedmont.

Alliance with Prussia in the war of 1866 against Austria gave Italy Venice, Oct., 1866, but only part of the Venetian provinces, for Bismarck allowed Austria to retain Trentino and Tirol as well as Venezia Giulia with Trieste and all Istria. This cutting in two of the Italian-speaking N.E. of the peninsula led to the irredentist movement, aimed at securing the union of all Italian-speaking lands, and a potent force in Italian politics for many years.

Rome Incorporated in the Kingdom
Garibaldi made another attempt upon Rome in Nov., 1867, but was obliged to yield to the French and papal armies at Mentana. But the Franco-Prussian war of July, 1870, forced France to evacuate Rome, and the fall of Napoleon III freed the king of Italy from the convention of 1864. Pope Pius X said only force would compel him to accept the king's suggestion that he should surrender his temporal power and place himself under the protection of Italy; and on Sept. 20 the Italians attacked. When they had breached the walls at Porta Pia, the pope ordered the garrison to cease fire, and the Italians occupied the city. Twelve days later, a plebiscite gave 133,681 votes for union with the kingdom of Italy, 1,507 against it. The unification of Italy was complete.

On Jan. 9, 1878, Victor Emmanuel II, the king who had made Italy, died, and was succeeded by his son, Umberto I. The political right, weakened by internal dissension and unpopular through its strict fiscal policy and administration, had given place in 1876 to a left wing administration under Depretis, who promised an extension of the suffrage, free education, relief from taxation, greater liberties. But the left found Italy internationally isolated, owing to the European

repercussions of her dissensions with the Vatican, and her colonial expansion in North Africa, where her ambition to recover the lands held by the Roman empire brought her into conflict with France, who seized Tunis in 1881. Depretis began negotiations with Germany and Austria, already bound to one another by an alliance. King Umberto I and Queen Margherita paid a state visit to Vienna, 1881, and on May 20, 1882, the triple alliance was formed, to be renewed in 1887, 1891, 1902, and 1912. Many Italians, however, viewed this alliance with misgivings, since it implied a renunciation of Italian claims to Trentino and Trieste.

The government now set about bringing order into internal affairs. A loan of £14,500,000 was raised in London, which allowed the treasury to resume payment in gold. The state rlys. were handed over to the management of three private companies (the state resumed possession in 1905); and a new assessment of land tax was introduced. The mercantile marine began to develop; and a movement to improve sanitation resulted from the cholera epidemic of 1884. Education was made compulsory in 1877; in 1882 those entitled to vote increased from 600,000 to 2,500,000; progressive reforms took place in provincial and municipal administration, and the excellent Zanardelli code of law was introduced.

Colonial Development

Italy's colonial development began when, on Nov. 15, 1869, an Italian shipping magnate named Rubattino bought the bay of Assab from the sultan of Raheita, paying for it with 47,000 lire furnished by the government. In Sept., 1881, the sultan accepted Italian protection. In the following Feb. an Anglo-Italian convention recognized the Italian title to Assab which, in July, was proclaimed an Italian colony. In Feb., 1885, Italy occupied Massawa, with British approval—an event which led to a clash with Abyssinia. The Abyssinian commander, Ras Alula, was defeated at Saati, Jan. 25, 1887, but next day a small Italian force was wiped out at Dogali, except for one survivor. This disaster caused consternation in Italy, and in Nov. the garrison at Massawa was strengthened. The British government tried unsuccessfully to mediate, and in March, 1888, the negus of Abyssinia advanced towards Saati. He was killed a year later, and his successor

Menelik signed a treaty with Italy at Ucciali, recognizing Italian rights in the area subsequently named Eritrea, and defining the frontiers between the new colony and Abyssinia; and in 1891 Great Britain recognized Abyssinia as within the Italian sphere of influence while Italy recognized British interests in the Upper Nile.

For a time internal social and economic unrest diverted Italy's attention from Africa. But in May, 1893, Menelik denounced the treaty of Ucciali, and in 1895 the war flared up, culminating in a heavy Italian defeat at Adowa, March 1, 1896. For several years thereafter Italy confined herself to the agricultural development of the colony of Eritrea.

At home, successive governments had to compromise with the growing strength of the left. Political events were punctuated by mob disturbances all over the country. Bread riots took place in 1895. In the chamber elected in 1900, the parties farthest to the left secured 100 out of 508 seats. A few weeks later, Umberto was assassinated, July 29, 1900, at a sports meeting at Monza, near Milan, by the anarchist Bresci.

Economic Problems and Progress

The first ten years of the reign of his son, Victor Emmanuel III, were difficult internally. Economic problems and strikes were accompanied by the rapid development of the socialist movement, which began to divide, in Italy as elsewhere, into a revolutionary section advocating uncompromising class warfare, and a moderate reforming wing. Later, a third section, the syndicalists, who opposed all legislative action, was formed. In the same period a parliamentarian of great abilities came to the front in Giovanni Giolitti, whose administration of more than a decade was on the whole progressive.

The economic capacity of the country expanded; the Simplon tunnel was made; the rlys. were extended; shipping was developed (Genoa becoming the second Mediterranean port). Political life was democratic-liberal, based on social amelioration.

The first outward sign of nationalist revival was the Turkish war of 1911 for Tripoli. Its object was to wipe out the ignominy of the Adowa defeat. Diplomatic exchanges were followed by an ultimatum to Turkey, Sept. 28, 1911, and war was declared next day. A wind of enthusiasm swept Italy. She annexed Tripolitania and Cyrenaica, Nov. 5; and in the

treaty signed at Lausanne on Oct. 18, 1912, she remained in possession also of Rhodes and the Dodecanese.

A new electoral law in 1912 increased the number of voters from 3,000,000 to 8,000,000, and in the elections of the following year the Socialists secured 79 seats, and a new Catholic party 33. In March, 1914, Giolitti resigned. He was succeeded by the liberal Salandra.

Outbreak of war in Aug. caused controversy in Italy. While the Socialists clamoured for neutrality, the nationalists, at first, were for war on the side of the central empires. But the government declared its neutrality on Aug. 3, on the grounds that Austria had failed to consult Italy before going to war; that Italy had been given no opportunity to mediate; and that the terms of the triple alliance did not bind Italy to share in aggression. Moreover, Italy was militarily unprepared, and much weakened by the Tripoli war. But soon those who favoured neutrality found themselves opposed by powerful groups which favoured intervention on the side of the Allies: their chief argument being that there was a likely opportunity to wrest *Italia irredenta* from Austria. It was at this stage that Benito Mussolini, till then editor of the Socialist organ *Avanti*, dramatically left the Socialist ranks, resigned his editorship, and founded the *Popolo d'Italia* in which he vigorously demanded intervention. In Oct. Baron Sonnino became foreign minister. On Oct. 31 Italy occupied the islet of Saseno off Albania, and on Dec. 26 the Albanian town of Valona—then both in Austro-Hungarian territory.

Italy Enters First Great War

Early in 1915 passions between those who favoured neutrality and those who favoured intervention were reaching a climax. Prince Bülow, sent from Berlin to Rome, tried to persuade Italy to remain neutral; but as Austria-Hungary still refused Italian demands for Trentino, Venezia Giulia, and the recognition of Trieste as a free city, Sonnino submitted to London a memorandum containing Italy's conditions for an eventual entry into the war on the side of the Allies. She based her demands simply on her irredentist claims, and on April 26, 1915, the secret treaty of London was signed by Italy, Great Britain, France, and Russia. On May 3 Italy denounced the triple alliance; there followed days of intense patriotic

fervour. On May 20 the Salandra cabinet received a vote of confidence in parliament of 407 to 74, and full powers in case of war; and on May 23 Italy declared war against Austria-Hungary. She entered the war at the moment when the Austro-German armies were sweeping the Russians out of Galicia, and the Allied offensive on the Western front had proved disappointing. General Cadorna was appointed c.-in-c.; and King Victor Emmanuel took up his h.q. with his troops at the front.

Defeats and Victories

Defeats in Trentino and on the Asiago plateau, May, 1916, led the government to resign, and the veteran Paolo Boselli formed a coalition government, retaining Sonnino as foreign minister. On Aug. 27, 1916, Italy declared war on Germany. But 1917 saw a serious increase in popular dissatisfaction, both at home and in the army. In Oct. came the Caporetto disaster, the result partly of bad generalship and partly of the apathy of the troops. This grave defeat brought the enemy on to Italian soil; but by Nov. 22 the army was holding the enemy on the Asiago-Grappa-Piave front. Cadorna was succeeded by General Diaz; Boselli by Orlando. The navy had some successes: in Dec., 1917, Commander Rizzo, penetrating the strong defences of Trieste, sank the battleship *Wien*. On May 14, 1918, Captain Pellegrini entered Pola in a specially designed motor boat and torpedoed the dreadnought *Viribus Unitis*; and on June 19, when an Austrian squadron ventured out for a cruise, Rizzo sank the battleship *S. Stephen* and damaged another.

In June the Austrians attacked and were repulsed on the Asiago-Piave front; four months later, on Oct. 24, Diaz launched a great attack along the whole front which destroyed the Austro-Hungarian army. An armistice, effective on Nov. 4, was signed at Villa Giusti near Padua; one week later came the Allies' armistice with Germany.

Victory brought no immediate reward to Italy, and soon the country fell prey to a great wave of disenchantment. In Feb., 1919, Italy put her territorial claims to the peace conference. In addition to those set out in the treaty of 1915, she asked for Fiume, which the previous Oct. had asked to be annexed to Italy. Negotiations in Paris were disappointing. Jealousies among the Allies, the rigid doctrinairism of President Wilson,

the difficult internal situation in Italy, all handicapped the Italian negotiators. On April 23, 1919, without consulting the Italian government, Wilson published his appeal to the Italian people explaining why he opposed their claims. The Italians were enraged, in particular d'Annunzio, the soldier-poet. On June 28, 1919, Italy was a signatory to the peace treaty with Germany.

Meanwhile, internal difficulties were increasing. In Jan. the *Partito Popolare*, Christian-socialist in character, was formed under the leadership of Don Luigi Sturzo. Labour troubles, in industry and in the public services, multiplied; and on Sept. 12 d'Annunzio with a small body of followers took possession of Fiume. The Fiume situation became a national and an international problem. The Italian government was officially against it, but many Italians were for d'Annunzio, especially those in Mussolini's new fascist movement.

On Sept. 10, 1919, the peace with Austria was signed at St. Germain-en-Laye. Italy secured the frontiers assigned to her by the treaty of London on the N. and N.E.; but the Fiume problem remained unsolved.

Rise of Fascism

At the elections of Nov., 1919, 156 socialists and 101 *popolari* gained seats; a number of fascists stood, but all were defeated. In the early part of 1920 the revolutionary movement was active. One cabinet succeeded another, until in June Giolitti once more took the helm. In Aug. the metal workers, many of them armed, took possession of factories in Piedmont, Lombardy, and Liguria. The authorities seemed helpless, and many acts of violence were perpetrated.

By the Rapallo treaty of Nov. 12, 1920, between Italy and Yugoslavia, Italy received Istria W. of the watershed, and the islands of Cherso, Lussin, and Pelagosa. Both countries recognized the independence of Fiume. By a secret clause, Yugoslavia was to receive Barros harbour, a part of Fiume. D'Annunzio refused to recognize the treaty and had to be evicted by military force. Owing to disorders at elections in the spring, however, Italian troops remained in the city, which eventually voted for annexation to Italy.

In Italy, fresh troubles broke out in town and country. Giolitti dissolved parliament and at the elections of May, 1920, the fascists secured 35 seats, liberals and

democrats 275, the popolari 107, the socialists 138, Bonomi forming a new administration. The socialists and popolari agitated for an expropriation of land bill. On Feb. 2, 1922, Bonomi resigned. He was succeeded by Facta, a worthy but not very able man. Trouble continued. On Aug. 1, the socialist trade unions called a general strike all over Italy. But the fascists and nationalists mobilised their forces, and gave the government 48 hours to restore order. There were fights between socialists and fascists in Milan and Genoa. On Sept. 29 at a fascist congress Mussolini gained the support of many non-fascists by declaring himself favourable to the monarchy. On Oct. 24, 40,000 fascists in military formation paraded the streets of Naples. Mussolini declared that "either the government will be given to us or we shall seize it by marching on Rome." Facta resigned on the 27th. On the 28th the fascist columns were advancing towards Rome. The king, fearing civil war, declined to sign a decree proclaiming martial law, and summoned Mussolini, who reached Rome on the 30th, shortly after the fascists had begun to enter the city.

Mussolini's First Cabinet

Mussolini formed a coalition cabinet, to which the chamber granted full powers for a year by 275 votes to 90. A fascist militia was promptly created; it helped to control the more troublesome elements of the former fascist bands, but it also provided the regime with an ever growing army of its own. The country was restored to a semblance of order. At elections held in April, 1924, fascism, which had absorbed the nationalists, was returned with an absolute majority. Parliament assembled in May. A fortnight later, June 10, a socialist deputy, Matteotti, was kidnapped and murdered, his body being found later some 10 m. from Rome. Four leading fascists were involved: they were arrested, but were acquitted, though some of their minor accomplices received short prison sentences. Both at home and abroad, the case aroused violent criticism, and was a serious setback in Italy to the fascist government. Mussolini, however, muzzled the opposition press under a decree of 1923 empowering local prefects to seize newspapers in which seditious matter appeared; and in March, 1926, the principal national newspapers were acquired by pro-fascist groups. Political organizations and such societies as

the freemasons were dissolved. A new criminal code (the Rocco code) was introduced in 1927: it contained laws "for the protection of the state," and increased penalties for various offences. On Sept. 19, 1928, the fascist grand council assumed the right of veto on all matters affecting the constitution, the prerogative of the crown, and the succession to the throne.

Tolerance, and even enthusiasm, for Mussolini's iron rule was provoked by his apparent success in foreign affairs. At the outset of his regime there had been the Corfu episode. In Aug. 1923, an Italian general and four of his staff on the Allied commission delimiting the Greco-Albanian frontier were murdered by Greeks. Mussolini demanded an indemnity. Greece demurred, denied responsibility, and an Italian fleet was sent to occupy Corfu. Greece appealed to the League of Nations; but the dispute was referred to the conference of ambassadors of the four great powers, who decreed that Greece should pay the indemnity. Greece accepted, and the Italians withdrew from Corfu. This success of a "strong" policy after so many discomfitures due to weak governments pleased the people.

Mussolini resumed negotiations with Yugoslavia, which in Jan., 1924, in Rome recognized Italy's sovereignty over Fiume, Italy recognizing Yugoslav sovereignty over Barro harbor. In 1924 Britain ceded part of Jubaland (E. Africa) to Italy; and in 1928 Mussolini made a pact of friendship with Albania, as a counter-balance to the intimacy developing between Yugoslavia and France. The Lateran treaty with the holy see, Feb., 1929, and its accompanying concordat in regard to religion in Italy, created friendly relations with the Vatican, and, by recognizing the Vatican city as a state, gave a sense of deep satisfaction to R.C.s throughout the world.

Industrial Development

Economically, efforts were made to accelerate development in every field. Trade was fostered; industries were assisted; public building reached an unprecedented level; towns were replanned; new roads were made, including motor-roads (*autostrade*); electrification of rlys. continued; output of electric power increased, thanks to the building of new power stations in the Alps; agriculture was intensively promoted. The Pontine marshes were reclaimed; fine cities were built in Tripolitania and Cyrenaica, and work was begun on

recovering some of their ancient cities from the sand, as well as on the development of agriculture in those non-fertile lands. Arts and letters were fostered; a first-rate Italian encyclopedia was published.

Behind all these efforts, however, lurked a nationalist spirit and the determination to make Italy a big military power. Even archaeology was made to serve the purpose of nationalism: it was presented as the resurrection of the glory that was Rome. The preliminary training of children was introduced with the object of increasing the strength of the army to a colossal number. Mussolini, indeed, boasted that he had 8,000,000 bayonets. To serve the dictator's ambitious plan, the entire economic life of the country was set under the rigid control of the state through a chain of corporations of industries and all other activities, until in 1938 the parliamentary system, already reduced to a mere fiction, was transformed into the corporative state.

Conquest of Abyssinia

From its beginning Nazi Germany was looked upon with suspicion by Mussolini, jealous of a fellow dictator; while the impotence of the League of Nations in face of aggression had become apparent when Japan occupied Manchuria. At the end of 1934 a convenient frontier incident provided Mussolini with a grievance against Abyssinia, who appealed to the League of Nations. Commissions sat, to no avail. Inside Italy there was a strong campaign insisting on Italy's need for "a place in the sun." In France, Mussolini had, or thought he had, the support of the government through a secret pact reached with Laval when the then French prime minister visited Rome in Feb., 1935, and promised him a free hand in Abyssinia. In Great Britain, opposition was both political and juridical, and it was true that Italy, as a member of the League of Nations, could hardly justify her threat of war against Abyssinia whom Italy herself had sponsored as a member.

In April, the prime ministers of Great Britain and France met Mussolini at Stresa to discuss the German situation; Mussolini's hope of broaching the subject of Abyssinia was frustrated on the ground that Abyssinia was not on the agenda. During the summer tension increased. A visit to Rome by Anthony Eden, then British minister without portfolio for League affairs, caused intense bitterness. Italy occupied Adigrat

on Oct. 5, Adowa on the 6th. On the 7th the council of the League declared unanimously that Italy had resorted to war in disregard of her covenants, and 50 out of the 54 nations represented decided on the imposition of sanctions against her. Italy meanwhile was pressing forward with the war. (For its course, see Abyssinia.)

At home, sanctions had the effect of rallying support for Mussolini, and the war gained in popularity when it became not a minor campaign against Abyssinia, but the struggle of modern Italy against the 50 powers which had approved sanctions.

Sanctions were, in fact, never effectively applied; and on May 5, 1936, after the capture of Addis Ababa, the Abyssinian capital, Mussolini proclaimed Victor Emmanuel ruler of Abyssinia and emperor of Ethiopia.

Rome-Berlin Axis

Fascist Italy was now definitely opposed to the Western democracies, and Germany seized the occasion to make warm overtures to her. The Rome-Berlin Axis was formed, Oct. 25, 1936. Open intervention by Italy and Germany in the Spanish civil war followed. That intervention left Italy's treasury empty, her military reserves depleted, while diplomatically it increased the gulf between Rome and the West and pushed Italy more and more into Germany's arms. In Sept., 1937, Mussolini paid a state visit to Berlin; in April, 1938, the visit was returned by Hitler. Germany's influence over Italy became more marked. In Sept., 1938, the British prime minister, Neville Chamberlain, who had already embarked on a policy of conciliation towards Italy, appealed to Mussolini to intervene with Hitler to spare Europe the calamity of a war. Mussolini, who desired nothing better than to place London and Paris under a personal obligation to him, arranged the meeting at Munich. But his good services were forgotten, and fascist Italy took her revenge with fresh claims against France.

In Jan., 1939, Chamberlain paid a state visit to Rome, and a fresh Anglo-Italian agreement recognized the Abyssinian empire. On Good Friday, Mussolini seized Albania, with nothing more than a murmur from the Western powers; and on May 22, Italy signed a treaty of alliance with Germany.

Yet when in Sept. war broke out, Mussolini proclaimed Italy a non-belligerent. Nobody wanted

war, and he therefore enjoyed a wave of much-needed popularity. After the German invasion of Norway, Mussolini was convinced that Britain's naval power was broken for good; and when France was on the eve of capitulation, thinking that delay would leave Italy outside the victor's camp, on June 10 he declared war on Great Britain and France. With that declaration of war Mussolini sealed the fate of himself, his regime, and Italy.

At no time was the war favourable to Italy; even on the French frontier, where the fighting was limited to a few days, the French territory occupied by Italy was gradually curtailed to suit the policy of the stronger German occupier. On Oct. 28, 1940, Mussolini attacked Greece, a catastrophic campaign which caused the resignation of Marshal Badoglio as chief of the general staff.

In N. Africa it seemed, in the spring of 1941, that the Italo-German forces were on the point of reaching Alexandria, and Mussolini actually went to the African front, complete with white horse and the sword of Islam, ready to enter Alexandria as a conqueror; but the Afrika Korps was repulsed and the war in N. Africa became a seesaw of alternating fortunes until it ended in May, 1943, with the Allied liberation of Tunis. The Italian territories in E. Africa, including Abyssinia, were occupied by the British during 1941. At sea the Italian fleet constituted a danger to the British convoys supplying Malta and Alexandria until the battle of Cape Matapan, March 28, 1941, when Italy lost three cruisers—heaviest ships in her navy—and two destroyers, without loss to the British.

Fascism in Decline

Inside Italy, the war had been most unpopular from the outset. The military defeats in Greece and Africa; the entry of the U.S.A. into the war (which meant that millions of children of Italian parents would find themselves enemies of the land of their fathers); and, above all, the intensive bombing of Italian cities by British and later U.S. air forces, brought an increasing restlessness among the people.

After the capture of Tripoli, last remnant of Italy's overseas empire, on Jan. 1, 1943, the prestige of fascism fell very low indeed. The fall of Tunis meant, as Rome radio predicted, that very soon the soil of Italy would be the theatre of bloody fighting. The general

desire to end the war grew apace, while the fascist party itself was disintegrating. On June 24, 1943, Mussolini made a speech to the party directorate in answer to a list of "recommendations" they had sent him which were, in fact, criticisms of the conduct of the war. He admitted the unrest in the country, and promised to impose the severest discipline. The Allies invaded Sicily on July 10. On the 19th, Mussolini met Hitler at Feltre, and asked him for military reinforcements. He failed in his quest, and on July 25 he fell.

Fall of Mussolini

Mussolini's downfall was carefully planned by a group of leading fascists. At a meeting of the fascist grand council on July 24 (the first since Dec. 7, 1939), called at the instance of its dissentient members, Count Grandi, former ambassador in London, moved that the king should resume command of the armed forces. The motion had been agreed upon privately at a prior meeting by various members. Mussolini, taken by surprise, opposed it violently. After a debate lasting all night and into the next day, it was carried by 17 votes (including that of Count Ciano, Mussolini's son-in-law) to nine. When the meeting closed, Mussolini went to the king, to find himself dismissed. On leaving the palace, he was arrested, having threatened the king with the mobilisation of the fascist militia if he were made to resign. The king asked Badoglio, who had never been a good friend to Mussolini, to form a government.

Mussolini's fall was the cause of much rejoicing in Italy, for the failure of the war had obliterated remembrance of his former achievements. But it was also the cause of much disturbance. Moreover, the government, in deadly fear of falling prey to the Germans who were already pouring into the country, hesitated to open negotiations with the Allies, and it was Aug. 12 before the Italian high command sent a delegate to Lisbon, to ask for Allied military help against the Germans. Mussolini's downfall, in fact, occurred some six weeks too soon—when it happened, the Allies were not ready to take full advantage of it. The Allies landed at Reggio on Sept. 3. On the same day an armistice was signed at Cassibile, near Syracuse in Sicily, to come into effect on Sept. 8. By that time the Italian army had disintegrated: for its members, Mussolini's overthrow had meant only one thing, the end

of the war, and, men and officers being divided in their opinions and loyalties, the army fell to pieces. Italy's unconditional surrender to the Allies was signed by Badoglio on board the British battleship Nelson on Sept. 29.

The Italian government had expected the armistice to be announced on Sept. 12. When Badoglio learned on Sept. 7 that the announcement was imminent, something like panic overtook the government. By this time there were 20 well-equipped German divs. in Italy, while there were only 12 divs. of Italian troops, ill-armed and without petrol for mobility. The king, the government, and the high command left Rome for Brindisi, behind the Allied lines, without appointing anyone to control affairs in the capital. Nevertheless, fighting broke out between Italian and German troops, until a German threat of an all-out bombing attack on Rome forced the Italians to sign an armistice on Sept. 10, and the Germans occupied the country to Naples and beyond. Mussolini, held under guard on the Gran Sasso, in the Apennines, was rescued by German parachutists, and set up a puppet fascist republic in N. Italy. The Allies entered Naples on Oct. 1. On the 13th, against the king's wishes, Badoglio's government declared war on Germany, and the Allies recognized Italy as a co-belligerent. (For the fighting in Italy, *v.i.* Italy, Campaign in.)

Country Divided Against Itself

Thus began for Italy the real tragedy of the war, with the people divided among themselves into pro-Allies and Mussolinians, and fighting for more than 18 months a fratricidal war instigated by Mussolini's republicans, while the Allies' campaign against the Germans went on doggedly mile by mile, leaving in its wake a terrible trail of misery and destruction—much of it, like the rooting up of the railways, wanton devastation by the Germans.

The fall of the fascist regime made possible the return of many political exiles, among them Count Sforza, and S. Italy became a political cauldron. The main cause of dissension was the monarchy. The returned exiles assembled in congress at Bari, Jan. 28-29, 1944, set up a committee of national liberation representing six anti-fascist parties which demanded the abdication of the king, whose support of Mussolini they considered responsible for the state of the country. The committee

would not cooperate with Badoglio either. But the Allies were not prepared to accept a change of premier. Allied military government followed the armed forces, reorganizing Italian territory as the Germans were expelled, and handing over to the Allied control commission as the combat zone moved forward. In Feb. all the country S. of the N. boundaries of the provs. of Salerno, Potenza, and Bari were handed over to Italian administration, and Badoglio's government moved to Salerno. On April 12, the king announced his desire to withdraw into private life and appoint his son Umberto, prince of Piedmont, as lieutenant of the realm as soon as Rome was freed. When on June 4 the Allies entered Rome, Victor Emmanuel III disappeared from the scene, Badoglio's government resigned, and a new cabinet including representatives of the anti-fascist parties was formed in Rome with Bonomi as president of the council in place of Badoglio. The new government had a difficult time. Material conditions in the liberated provinces were bad, with food scarce and unfairly distributed through the government's inability to control the black market.

Horrors of German Retreat

The war between the Allies and the Germans was meanwhile moving N., more and more of the country coming under Italian administration. With the British 8th army fought six Italian divs., and a reconstituted Italian air force helped to maintain contact with the partisans behind the German lines, and to supply Tito's forces in Yugoslavia. The Germans in their retreat blew up every bridge, viaduct, power station, and tower. At Salò, on Lake Garda, Mussolini continued his fanatical collaboration with the Germans; and in the N., too, was waged the great civil strife between Mussolini's republican-fascists and the partisans, who fought both their fascist compatriots and the Germans. The tortures inflicted upon captured partisans by the fascist counterpart of the S.S. vied with the worst atrocities of the Germans. The number of patriots actively fighting in the N. was estimated at 200,000, and nearly 100,000 lost their lives. Drawn from all classes and all parties, united and organized under local committees of national liberation, they did invaluable work for the Allies. They rose on April 24, liberating Milan, Genoa, and Turin two days

before the surrender of the German army in Italy on April 29. Mussolini was caught by partisans on the 28th at Dongo, Lake Como, while trying to escape to Switzerland, and executed immediately.

Fighting in Europe ended a few days later. Italy was, politically and economically, in a state of prostration and turmoil. The N. remained under Allied military government, a situation not comprehensible to many Italians since they had helped to defeat the Germans. By the end of 1945, however, A.M.G. had handed back to Italian control all Italy except Venezia Giulia, Udine, and S. Tirol. Negotiations went on for the formation of a new government between the N. and S. committees of liberation, hampered by divergent views between left wing parties, which wanted the committees to remain in being, and liberals, who held that they would but double the functions of regular government organs. The Bonomi government resigned in June, and a series of governments followed. The *consulta*, a nominated consultative council set up to serve as a parliament pending the election of a constituent assembly, met on Sept. 25, 1945, and in March, 1946, chose June 2 as the date for the general election and a simultaneous referendum to decide whether Italy should remain a monarchy or become a republic. Victor Emmanuel III abdicated on May 9, and next day his son was proclaimed king as Umberto II.

Post-War Politics

In the country, three main parties had taken shape—the Christian democrats, led by de Gasperi, the socialists under Nenni and Saragat, and the communists under Togliatti. None of them, however, was free from factions; and there were numerous smaller parties—monarchists, liberals, republicans, the Action party, and, gaining ground by leaps and bounds through popular discontent, the party of Uomo Qualunque (common man), led by Giannini, which embodied all those with grievances who expected nothing good from the new life and regretted much of the old. The general election, held under a new system of proportional representation, gave 207 seats to the Christian Democrats, 115 to the Socialists, and 104 to the Communists, who jointly held the balance against the Christian Democrats. No party had a working majority, and the government

had of necessity to be once more a coalition. It was headed by de Gasperi, who in Nov. transferred foreign affairs to Nenni.

The referendum gave 12,717,923 votes for a republic, 10,719,284 for the monarchy, with 1,498,136 invalid papers. Umberto and his supporters at first disputed the validity of the result, but he decided that he would serve his country best by leaving Italy, and retired to exile in Portugal on June 13, 1946. On the 28th, the constituent assembly elected Enrico de Nicola provisional president of the new republic. (For later events see N.V.)

Peace Treaty of 1947

Discussions on the Allied-Italian peace treaty began at the meeting of the Allied foreign ministers in London in Sept., 1945. The major problems connected with it concerned Trieste and Venezia Giulia, claimed by both Italy and Yugoslavia, and the Italian colonies. Further discussions in Paris in July, 1946, and in New York, Nov.-Dec., resulted in the drawing up of a peace treaty which was signed in Paris on Feb. 10, 1947. After ratification by Italy and the U.S., British, French, and Russian govts., it came into effect at midnight of Sept. 15-16, 1947.

Under the treaty, Italy lost Trieste, which was created a free zone; a large part of Venezia Giulia and the Zara enclave in Dalmatia, which passed to Yugoslavia; four small areas in the Alps Maritimes to France. The cession of the Dodecanese is. to Greece was confirmed, as was also the independence of Albania and Abyssinia. Italy renounced all right and title to her former colonies of Libya, Eritrea, and Somaliland, the disposal of which was to be determined within one year of the treaty's coming into force. Other clauses covered the payment of reparations over a period of seven years to Russia (\$100,000,000), Yugoslavia (\$125,000,000), Greece (\$105,000,000), Abyssinia (\$25,000,000), Albania (\$5,000,000), and set limits to her armed forces. C. M. Franzero

Bibliography. Italy and Her Invaders, T. Hodgkin, 1892-99; *Guelphs and Ghibellines*, O. Brown-ing, 1894; *The Civilization of the Renaissance in Italy*, J. Burckhardt, 1898; *Garibaldi and the Making of Italy*, G. M. Trevelyan, 1911; *A History of Italy*, 1871-1915, B. Croce, 1929; *Italy after the Renaissance*, L. Collinson-Morley, 1930; *The Evolution of Modern Italy*, 1715-1920, A. J. Whyte, 1945; *Contemporary Italy*, C. Sforza, 1946.

LANGUAGE AND LITERATURE. Side by side with the Latin which Cicero spoke existed the language of the people. From this debased Latin the Italian language emerged about A.D. 1000 in the shape of numerous dialects, and ousted the Greek of Sicily and the South. Italian literature, however, began strangely late in the history of the nation. Whatever of literature persisted through the 600 years of barbarian conquest after Boetius (d. c. 525) was written in Latin, and was mainly legal or theological. Even for a long time afterwards those who might have been the greatest Italian prose writers—Petrarch, Poliziano, Pontano, and Aeneas Sylvius, for instance—continued to use Latin, since that was the common language of educated Europe. Dante's *Vita Nuova* (c. 1292) was the first prose work of any importance in the vernacular.

Poets in Italy had been using the Provençal dialect, which formed a link between Italian and French. But about 1220, Emperor Frederick II established a brilliant literary court at Palermo, and, himself a poet, patronised a school of vernacular poetry cast in the forms developed by the Provençal troubadours. The diffuse forms of the Provençal lyric were presently condensed and regularised by Italian writers into the sonnet, canzone, and ballata. After the destruction of the Hohenstaufen dynasty, the university of Bologna, through Guido Guinicelli (died 1276), handed on the torch of literature from Sicily to Tuscany.

Dante's Incomparable Epic

During 75 years many, but not great, poets prepared the way for Dante Alighieri. Cino da Pistoia and his elder contemporary, Guido Cavalcanti at Florence, refined and dignified the lyric, mingling the chivalrous sentiment of the troubadours with the science of Aristotle and the thought of Aquinas. But Dante belonged, also, to the new era through his appreciation of individuality and delineation of real life. His life was divided between politics, which resulted in his banishment in 1302, spiritual love, and poetry. Politics produced philosophical treatises like the *De Monarchia*. The poetry of spiritual love was inspired by Beatrice. In the *Vita Nuova* he recorded his intense platonic passion for her; the *Divina Commedia* is his poetic apotheosis of her after her death. This great epic suffices in itself to place Italian literature in the first rank. By writing in Tuscan

rather than in Latin, Dante promoted the Florentine idiom to the dignity of being definitely accepted as the Italian language.

At this time there began a revival of interest in the great writers of antiquity. Francesco Petrarca (1304-1374) and, under his stimulus, Giovanni Boccaccio (1313-1375), were the most enthusiastic propagandists of such humanistic studies. But their importance lies chiefly in this, that while Petrarch, following Dante and inspired by Laura, confirmed the choice of the Tuscan dialect as the vehicle of Italian poetry, Boccaccio performed the same service for Italian prose.

Boccaccio studied Greek, and popularised classical literature; he lectured on Dante, and in his *Teseide* and *Filostrato* chose the octave stanza for Italian epic poetry. But his great achievement was *Il Decamerone*, in the introduction to which, echoing Thucydides, he draws, in vigorous unaffected prose, a wonderful picture of the plague of 1348 (see *Decameron*). His earlier stories, *Filocolo* and *Ameto*, the forerunners of pastoral and psychological romance, were written in an artificial and ornate style.

Successors of Boccaccio

Boccaccio was succeeded as a writer of "little novels" by the Florentines Franco Sacchetti and Giovanni Fiorentino, the Neapolitan Massuccio, and in the 16th century by Matteo Bandello and Grazzini (*Il Lasca*), a founder of the famous Accademia della Crusca. Most of their stories are based upon actual incidents of public or private life, and they present, therefore, a valuable picture of the times. Gianfrancesco Straparola, however, in his *Notti Piacevoli*, 1554, set the example, brilliantly followed in the *Pentamerone* of Count Giovanni Basile, of founding his tales upon folklore. The stories of Giovanni Cinthio (b. 1504) and Luiga da Porto (d. 1529) have attained immortality as the source of some of Shakespeare's plays.

A literary death followed the Black Death, which carried off Petrarch's Laura, and the historian, Giovanni Villani. After the fall of Constantinople, the study of Greek was revived by refugee scholars. Enthusiasm for Greek literature had already been roused by Manuel Chrysoloras, who, coming to seek aid against the Turks, had lectured at Florence and elsewhere. Classical scholarship was now eagerly pursued, especially at Florence, in the Neo-

Platonic Academy founded by Marsilio Ficino under the auspices of Cosimo and Lorenzo de' Medici. Almost simultaneously there came a revival of Italian letters. Lorenzo's own polished lyrics, now serious, now gay, and those of Poliziano, the brilliant classical scholar, pulsating with a deeper note of poetry, gave literary form to the racy popular songs of Tuscany. Poliziano's lyric tragedy, *Orfeo*, inaugurated the long line of Italian dramatic opera.

15th Century Dramatists

Leon Battista Alberti (1407-72) kept alive the tradition of Italian prose; and the Neapolitan Jacopo Sannazzaro (b. 1458), with his pastoral romance, *Arcadia*, imitated by Sir Philip Sidney, proved that Tuscany was not its sole begetter. Luigi Pulci (1432-87) produced in *Morgante Maggiore* the first great modern burlesque of the chivalrous epics in which Charlemagne and his paladins were eulogised as the conquerors of the Pagans. Orlando and Rinaldo, whose characters are finely drawn in this poem, are the noble heroes of Orlando Innamorato. That romantic epic was left unfinished by Matteo Boiardo, a courtier of Ferrara (1434-94). It was continued, in a far more brilliant manner, with perfervid imagination and characteristic Italian ironic wit, by another courtier of the House of Este, Ludovico Ariosto. In the melodious flow of masterly narrative, in delicious burlesque episodes, in the wealth of his similes and the beauty of his reflections, the Orlando Furioso reveals Ariosto as a supreme artist and a poet who ranks next to the greatest.

We have now reached the golden era of the High Renaissance. Art and the study of science and the classics absorbed much of the genius of the nation. But the artists themselves lived at many points. Giorgio Vasari wrote their lives; Benvenuto Cellini, the Florentine goldsmith, wrote his own, and in one of the frankest and most fascinating of human documents painted the life and manners of the 16th century. The sonnets of Michelangelo Buonarroti have the same quality of passionate strength and intensity as his sculpture and painting. In an age when all refinement centred in courts, Count Baldassare Castiglione set forth in his *Il Cortegiano*, 1528, the whole duty of the courtier. Portraying fashionable and intellectual life at the elegant court of Urbino, his book attained that high standard of elegance and polish which was now the goal of all Italian art. About the same

time Giovanni della Casa wrote his *Galateo*, a manual of instruction for the lesser gentlemen. His *History of Italy* during his own time marks the Florentine Francesco Guicciardini (1483-1526) as the first modern historian. Unlike Pietro Bembo's *History of Venice*, his is the work of a practical statesman.

The greatest writer of this period was Niccolò Machiavelli. Interpreting the political life of his day, and considering it, not in the light of morality or dogma, but of practical experience, he endeavoured to show how the ideal ruler, guided by expediency, might check the inherent corruption of the State by repressive laws and versatile, unscrupulous statecraft. Dante had preached his ideal of a universal monarchy ruling in righteousness. It is Machiavelli's glory to have foreseen the advantage of a united Italy.

Division in Schools of Poetry

In the 16th century the stream of Italian poetry divided into two channels, Petrarchian and burlesque. Among the followers of Petrarch the chief were Sannazzaro, Luigi Tansillo, Angelo di Costanzo, Giovanni Guidiccioni, Annibale Caro, Giovanni della Casa, Antonio Tebaldeo, Bernardo Tasso, Francesco Molza, and Pietro Bembo, who was accepted as the literary dictator of his day. Of the innumerable writers of burlesque and satiric verse, the most important are Luigi Alamanni and Francesco Berni. The latter gave his name (Bernesque) to the *capitoli*, burlesque essays in verse, typical of the spirit of the age. The Sofonisba, 1515, of Giorgio Trissino is the first blank verse tragedy in the vernacular. Torquato Tasso followed with *Torrismondo*, 1586. Comedy, too, modelled on Plautus and Terence, emerged in the work of Boiardo (Timone), Cardinal Bibbiena (Calandria), Ariosto (Casaria), Machiavelli (Mandragola), and Pietro Aretino, a base writer of base plays and lampoons. Pastoral comedy was perfected by Tasso (*Aminta*, 1573; *Pastor Fido*, 1590), and Giovanni Guarini. These were written in the irregular metre first introduced by Sperone (1500-88) in his classical tragedy *Canace*, and later associated with opera.

The Catholic Revival, the Inquisition, and a censorship which repressed all original thought and criticism proved fatal to Italian art and literature. Yet Torquato Tasso, the last great genius of the Renaissance, owed something to his Jesuit training in his choice and treatment of his great Christian

epic of the Crusades, *Gerusalemme Liberata*. Torquato, writing at the court of Ferrara, and tortured by the delusions of intermittent insanity, produced a poem which, though picturesque rather than sublime, ranks as an epic with the *Aeneid* and *Paradise Lost*. The sunset of the Renaissance was followed by the midnight of the baroque style of the Jesuits. The crude multiplication of ornament in architecture was echoed in literature by laboured conceits in a dreadful "high style." Giovanni Battista Marino was the representative poet of this order. Gabriello Chiabrera, however, set a better example by aiming at the perfection of Greek form in his *Canzoni*. Civil and ecclesiastical tyranny could persecute, but not suppress, the genius of men like Galileo, Telesio, Bruno, and Campanella, whose philosophical works entitle them to a place in literature as well as in science.

In the 18th century a literary revival began. Sicily produced a great lyricist in Giovanni Meli, whilst the *Giorno*, 1763, of Giuseppe Parini satirised, in the vein of Pope, the life and manners of Milan. Serious work in the region of philosophical, historical, and political writing was done by Giovanni Vico, Lodovico Muratori, Count Scipione Maffei, and Cesare Beccaria. Italy, which in the 15th and 16th centuries had restored to Europe the wisdom and poetry of ancient Greece and Rome, now gave it the music of the modern opera and the poetical libretti of Apostolo Zeno and Pietro Metastasio. The literary shepherds of the "Academy of Arcadia" were laughed out of fashion by the gay mockery of Carlo Goldoni, the one great Italian comedian. Modelled upon Molière, his comedies satirised the idle habits of the day; but, delightful as they are, they had no successors. Goldoni was himself driven from the Venetian stage by the ridicule of Carlo Gozzi, whose burlesque dramatisations were founded on the fanciful tales of the *Pentamerone*.

Revival of National Spirit

The classical tragedies of Count Maffei (*Merope*, 1714) and Count Vittorio Alfieri (Saul, *Myrrha*, etc.) achieved European fame. Alfieri used historical themes to convey his ideas of liberty and protests against the enslavement of his country. His appeals to the future of the Italian people mark him as one of the revivers of the national spirit. The great poets of the revolutionary period were Vincenzo Monti, Ugo Foscolo, and Giacomo Leopardi, the supreme perfection

of whose patriotic odes and other poems ranks him as the greatest Italian poet after Tasso. Foscolo's romance, *Jacopo Ortis*, written in exile in the naturalistic and sentimental manner of Rousseau and Goethe, is a cry of despair at the enslavement of Italy.

The romantic school, identified with liberalism and the struggle against foreign despotism, produced the greatest Italian novel, *I Promessi Sposi*, 1827, by Alessandro Manzoni. In his poems, also, and in his patriotic plays, Manzoni fostered the idea of Italian national freedom. Giovanni Batista Niccolini (Arnaldo di Brescia, 1843) likewise used the stage for patriotic propaganda. The dramatist, Silvio Pellico, by the simple record of his sufferings at the hands of the Austrians in *Le Mie Prigioni*, 1832, stirred not Italy only, but all Europe. The thrilling songs and ballads of Giovanni Berchet gained him the title of the Italian Tyrtæus. The political poems and satires of the Tuscan, Giuseppe Giusti (Sant' Ambrogio, etc.), of the Roman Gioacchino Belli, of Pietro Giordani, and of Gabrielle Rossetti, and the war poems of a hundred others helped to fan the flame of Italian patriotism. It was blown to a white heat by the eloquence of Giuseppe Mazzini.

The spokesman of moderate reform, Vincenzo Gioberti (*Il primato degli Italiani*, 1843), Cesare Balbo (*Speranze d'Italia*), and Massimo d'Azeglio (*I casi di Romagna*, 1846), directed Italian opinion no less surely to the goal of union.

Modern Novelists

Nineteenth century Italian fiction suffered from a tendency to cosmopolitanism. There was very little new or original in it. Giovanni Verga, the Sicilian realist, and Grazia Deledda, the Sardinian, realized the value of local colour; whilst Matilda Serao portrayed with sympathy and observation the passion and sentiment of the poor crowding the fetid alleys of Naples. Gerolamo Rovetta used the novel as a weapon of social and political propaganda, and Antonio Fogazzaro, poet and novelist with a strong touch of northern mysticism, used his art as a means of inculcating his religious and political ideas.

Much first-rate historical work, municipal and national, was done by Gino Capponi, Cantù, Troya, and Colletta, Pascale Villari, Giuseppe Ferrari, Ruggero Bonghi, and many others. From a crowd of

playwrights, of whom Pietro Cossa (Nerone) is noteworthy, Paolo Ferrari stands out as a writer of historical comedies (*Il Goldoni*, etc., 1852) which are literature.

In poetry three names emerge. The vigorous lyrical genius, the liberal mind and nervous style of Giosuè Carducci (1835-1907) grafted modern ideas upon the forms of ancient art (*Odi Barbare*, 1877), and thus rescued Italian poetry from the fluent but feeble romanticism of the followers of the mid-century poets, Giovanni Prati and Alcardo Alcardi. Giovanni Pascoli (1855-1912) wrote poetry that has great beauty of expression.

D'Annunzio and Other Poets

The versatile Gabriele d'Annunzio (1863-1938), novelist, dramatist, and lyric poet, with his gift for sonorous and inspired patriotic writing, and his deliberate enlargement of the too circumscribed literary vocabulary won a lasting place among Italian writers. Guido Gozzano, who died in 1916, aged 33, left behind one slender volume of poems; yet he had an influence on Italian poetry as lasting as that of d'Annunzio.

Leonardo, a review founded in 1908 by Giovanni Papini, expressed the revolt of young writers against the positivism of the previous century. Notable examples of the diverse works of Papini himself, to whom Italian letters owe a great deal, are *Un Uomo Finito* and *la Storia di Cristo*. About 1910 there appeared the futurist movement, headed by T. F. Marinetti. The futurists' "free verse" produced some good if startling poetry; but it degenerated into buffoonery. Many former futurists, e.g. Ardengo Soffici, Enrico Cavacchioli, Umberto Boccioni, Luciano Folgore, Corrado Govoni, abandoned the style and returned to more normal forms of expression.

The period immediately after the First Great War produced a group of negativists, one of whom, Pitigrilli (Dino Segre), achieved astounding popularity with novels and tales whose vitriolic humour expressed the spiritual anarchism of those years. This negative tendency reached a higher plane in the *Indifferenti* of Alberto Moravia (Alberto Pinkerle). Alfredo Panzini, most modern of classicists, introduced into literature the vocabulary of everyday life. Other writers of a classical tendency were the novelists Riccardo Bacchelli (the trilogy *Il Mulino del Po*), Antonio Beltra-

melli, Francesco Chiesa, Massimo Bontempelli, Corrado Alvaro, and the essayists Emilio Cecchi, Vincenzo Caradrelli, Antonio Baldini.

In a world apart stands Luigi Pirandello, a dramatist of international repute, and a greater writer of short stories which are masterpieces of narrative. Poetical dramas came from the pens of Sem Benelli and Ercole Morselli, as well as d'Annunzio; while Roberto Bracco, Ugo Betti, E. A. Butti produced dramas of ideas, Luigi Chiarelli and Luigi Antonelli dramas of the grotesque.

Fascism tried to stimulate arts and letters; but, like all dictatorships, failed in the attempt. After the Second Great War there was a strong revival of literature, characterized by introspection and an autobiographical tendency. Names of note were the mystical poets Dino Campana and Giovanni Boine, the idealist Francesco Flora, and the neo-symbolists Ungaretti, Saba, and Villaroel.

Twentieth Century Philosophers

Outstanding figure among prose writers of the 20th cent. was the philosopher and historian Benedetto Croce (b. 1866) who achieved world-wide fame. His first work, *Filosofia dello Spirito*, was published in 1902, and more than 40 years later he was still producing works of merit and scholarship. His philosophy, often erroneously described as Hegelian, derives more properly from the ideas advanced by G. B. Vico in his *Scienza Nuova*. The most important aspect of Croce's philosophy is its liberalism. *Il Demiurgo*, by another liberal teacher, Filippo Burzio, contains an original conception of spiritual perfection.

Bibliography. History of Italian Literature, R. Garnett, 1898; History of Early Italian Literature to the Death of Dante, A. Gaspary, Eng. trans. by H. Oelsner, 1901; Modern Italian Literature, L. Collison-Morley, 1911; History of Italian Literature, F. Sanctis, and J. Redfern, 2 vols., 1932.

ART. The civilization of ancient Rome sank too deeply into the heart of Italy to be ever quite forgotten. Throughout the dark ages classical traditions lingered on, and a Roman school of painting remained in existence until the papal see was removed to Avignon. At the same time the influence of Byzantine art made itself felt in Sicily and Apulia, at Venice and Ravenna, while Tuscan painters adopted the types laid down by the second council of Nicaea for the representation of Christian subjects. It was not till the

beginning of the 14th century that a revival came.

Giotto, the great awakener, according to the old legend, was taken straight from the sheepfolds to be the pupil of Cimabue; but he probably owed more to the sculptor, Giovanni Pisano, and to Pietro Cavallini, a Roman master, whose recently discovered frescoes in S. Cecilia show a marked affinity with the types usually called Giottesque. It is at Assisi that the first-fruits of the new art must be sought. Roman and Tuscan masters adorn the walls of the sanctuary that arose above the tomb of S. Francis with frescoes of Old and New Testament story, and in the upper church the young Giotto painted his wonderful series of scenes from the life of the great evangelist. Much of Giotto's work has perished and what is left has been ruined by decay and restoration; but his frescoes at Assisi, at Padua, and Florence revealed the new life which he brought to art. In his works Italian painting became a genuine expression of the national character, and for the next hundred years his followers repeated his types or applied his principles to other compositions.

Influence of Masaccio

The next step forward was taken by Masaccio, who gave a new direction to Florentine art, and whose frescoes in the Brancacci chapel became an example for generations of painters. They showed the influence exerted on the sister art by the great sculptors Brunelleschi and Donatello. Throughout the 15th century a succession of gifted masters developed Masaccio's principles in different directions. Fra Angelico painted the heavenly visions of his pure and tender soul on the convent walls of S. Mark, while the more worldly minded Carmelite, Fra Filippo Lippi, gave free expression to his delight in natural beauty and human joys and sorrows. Paolo Uccello grapples successfully with problems of flight and movement, of perspective and light and shade, while the goldsmith-painters, Pollaiuolo and Verrocchio, lent plastic relief to painted forms by vigorous drawing and modelling, and made experiments with oil varnishes in the new medium that was rapidly taking the place of tempera.

Meanwhile the movement inaugurated by Giotto was spreading throughout Italy. Byzantine traditions lingered longest in Siena, where Duccio and his followers

lent art a peculiar sweetness and decorative charm, and Giotto's influence was slow in penetrating. In Umbria, Florentine principles were introduced by the Tuscan master, Piero della Francesca, and by Fra Angelico's follower, Benozzo Gozzoli, who worked in Perugia and the neighbouring hill-cities. Here a long line of talented artists led up to Perugino, whose wistful madonnas and yearning saints, set in wide landscapes under sunlit skies, are as popular today as in his lifetime.

North Italian Art

Giotto's frescoes at Padua and Donatello's bronzes in the great basilica of Il Santo produced a striking effect on the development of art in N. Italy. Here Mantegna imbibed the passion for classical antiquity reflected in his works, and the Veronese masters Altichiero and Pisanello gained the knowledge which they passed on to Poppa, the founder of the Lombard school. While in Tuscany and Umbria painting flourished under the protection of the free republics, the merchant guilds, and the great religious orders, and in Rome popes and cardinals encouraged art in all its branches, N. Italian painters found their best patrons in the reigning families of the city states. The courts of the Estes at Ferrara, of the Gonzagas at Mantua, of the Sforzas at Milan, and of the Bentivoglios at Bologna became centres of light and learning to which the foremost masters were attracted. Farther S. the Malatestas of Rimini and the rulers of the house of Aragon and Naples evinced the same interest in art and artists, while it is the glory of the little court of Urbino to have fostered the genius of the youthful Raphael.

Italian painting reached its zenith towards the close of the 15th century, and the years 1480-1520 witnessed an unequalled outburst of artistic activity. A chosen band of Florentine and Umbrian masters painted the frescoes of the Sistine chapel in the Vatican, Ghirlandaio filled the churches of Florence with portrait groups of his contemporaries, and Benozzo Gozzoli completed the long series of pictures in the Campo Santo of Pisa (left in a lamentable condition from fire in the Second Great War), Perugino adorned the Exchange at Perugia with allegorical figures and Roman warriors, while Pinturicchio painted the story of Aeneas Sylvius in the cathedral library at Siena, and Luca Signorelli represented the

terrors and glories of the Last Judgement in the Duomo of Orvieto. Sandro Botticelli decorated the Medici villas and shrines with Greek myths and madonnas as human as Fra Filippo's and as spiritual as those of Angelico, and Leonardo da Vinci painted his divine Cenacolo and the immortal portrait of Mona Lisa. Michelangelo unfolded the epic of Creation and Redemption in the sublime frescoes of the Sistine chapel while in the Vatican halls, the finest thought of Renaissance scholars on the philosophy of Greece and the faith of the Catholic Church was set forth in the consummate art of Raphael.

In this age of the full Renaissance Florence retained her old prestige, and the greatest masters who were not her citizens came to complete their education within her walls. Here Perugino and Signorelli acquired their technical skill, and Raphael, after assimilating all that was best in Umbrian and Ferrarese art, came to learn fresh lessons in the Brancacci chapel and the cells of S. Mark. One school alone, that of Venice, stood apart from the rest, and was comparatively little affected by Florentine examples. Even here Gentile da Fabriano and Pisanello were employed in the 15th century to paint the council hall in the ducal palace, and the Bellini brothers owed much to their early connexion with Mantegna and the school of Padua. But from the first Venetian art bore a strongly distinctive character.

The Venetian School

The art of Venice was conspicuous for splendour of colour. The deep religious feeling and high imaginative gifts of the Venetians found expression in the madonnas and pias of Giovanni Bellini, and in the lyrical dreams of Giorgione, while their natural love of pageantry was embodied in the mural paintings of the ducal palace and of the walls of the wealthy confraternities. Portraiture was another branch of art in which the Venetians excelled and in which the Bellini, Giorgione, Lotto, and Tintoretto alike displayed their individual talents. All these different strains reached their highest development in the work of Titian. When he died in 1576 Italian painting was already on the downward path.

The early death of Raphael, some 50 years before, was a fatal blow to art. His scholars, bereft of the guiding brain, sank rapidly into decadence, and the sack of

Rome, a few years later, marked the close of the golden age. In Florence the after-glow of the Renaissance lingered on in the work of Andrea del Sarto and his followers, while at Parma the young Correggio rendered the joy of life with spontaneous charm. In Venice the life of art was prolonged for another 200 years by a succession of brilliant painters who decorated vast spaces on an imposing scale. Tintoretto, Paolo Veronese, and Tiepolo attained a just celebrity in this field, while the landscape painters Canaletto and Guardi were hardly less renowned.

In the 17th century, the renewed activity of religious life known as the counter-reformation produced a corresponding revival in art and gave rise to the school of the Carracci at Bologna. The aim of these painters and of their principal followers, Guido Reni and Domenichino, was to imitate the great Renaissance masters, but their efforts fell lamentably short of the goal, and ended in feebleness and mannerism.

The first great Italian sculptor was Niccolò Pisano, whose pulpit in the baptistery of Pisa marks an epoch. Roman, Byzantine, and French Gothic elements are all apparent in his work, while the more dramatic genius of his son Giovanni exerted a powerful influence on Giotto and his contemporaries. Florence became the centre of the sculptor's art, and the followers of Pisano adorned her shrines with a series of famous works, the reliefs of the Campanile, the statues of the Duomo and Or San Michele, and the gilded gates of the baptistery.

Florentine Sculptors

Three masters were prominent among the Florentine sculptors in the early years of the 15th century. Lorenzo Ghiberti introduced new decorative charm into plastic art by his skilful use of landscape, Luca della Robbia combined a consummate mastery of composition with tender devotional feeling, and Donatello grafted his vigorous realism on a profound study of the antique.

A host of artists followed in the steps of Ghiberti and Luca, while Donatello's mantle fell on the goldsmith artists, Antonio Pollaiuolo, whose intimate knowledge of the human form and power of rendering movement brought new life to sculpture, and Andrea Verrocchio, whose equestrian statue of Colleone in Venice is a worthy rival of Donatello's Gattamelata. The presence of this last-

named statue in Padua, and of Donatello's other masterpiece, the high altar of S. Antonio, gave a marked impulse to sculpture in N. Italy. Here the splendid foundation of the Visconti and Sforza dukes—the Duomo of Milan and the Certosa of Pavia—fostered the growth of a new and flourishing school. Chief among those sculptors was Omodeo, whose sympathy with humanist studies and delight in rich ornament are displayed in the sumptuous façade of the certosa.

Famous Sepulchral Monuments

Italian sculpture, whether Florentine or Lombard, Roman or Venetian, excelled, above all, in the execution of portrait busts and sepulchral monuments. Countless examples of the former are to be seen in the museums of Florence, at South Kensington, and in the Louvre, while the tombs of the Scaligeri in Verona, of the popes in Rome, and of the doges in Venice, the monument of the cardinal of Portugal at San Miniato, and the Sforza effigies at the Certosa, are among the best known works of the Renaissance. An earlier and even more beautiful tomb is that of Ilaria del Carretto at Lucca, immortalised by Ruskin. This was by a Sienese master, Jacopo della Quercia, whose noble reliefs on the portal of San Petronio at Bologna influenced Michelangelo.

This great master, painter, poet, and architect, always declared that sculpture was his favourite form of art, and it is as a sculptor that his genius is above all pre-eminent. From the first he realized the full significance of the human body, its value for decorative purposes and as a means of expression. Every stone which he carved bore the stamp of his passionately striving, much-enduring soul. Several of his works—the Pietà in S. Peter's, the colossal David, and the Tombs of the Medici—are among the sublime creations of Italian sculpture. After his death the great traditions of his art were carried on in various forms by such masters as Sansovino, Benvenuto Cellini, and Giovanni da Bologna, the popular sculptor of the marble groups and fountains which adorn the squares and gardens of Florence. These again were succeeded by Bernini, whose talent and amazing activity filled Rome with colossal gods and goddesses, and tasteless allegorical figures, and whose so-called *baroque* art found countless imitators during the next two centuries.

Bibliography. An Introduction to Italian Painting, Sir C. Holmes, 1929; Italian Painting, P. G. Konody and R. W. Wilenski, 1929; Italian Schools of Painting, S. C. Kaines Smith, 1930; The Quattrocento, A. Stokes, 1932; Italian Painting, Later Italian Painting, T. Borenus, 1945.

ITALY: CAMPAIGN IN, 1943-45

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The Allied assault on Italy, undertaken to force Italy out of the war, was quickly successful in that intention; but after Italy had capitulated, the Germans fought stubbornly up the length of the peninsula, surrendering only a week before their general surrender. See also Alexander, F.-M.; Cassino; Eighth Army; Gothic line; Gustau line; Hitler line, etc.

The conquest of Sicily was the first stage in the Allied campaign against Axis-occupied Europe. The planning for Operation Husky, as it was called, began before the N. Africa campaign ended.

Axis forces in Sicily amounted to 12 divisions: 10 Italian and two German. A fleet of nearly 3,000 vessels of all types carried to the island two Allied armies—British 8th, commanded by Gen. Montgomery, and U.S. 7th, commanded by Gen. Patton—of a total strength of about 12 divisions. The airborne troops who preceded them failed, owing to heavy cross winds, to pick out their appointed landing areas, and many men were dropped wide of their objectives—some of them into the sea. They succeeded nevertheless in throwing the enemy's second line of defence into confusion by the time sea-

borne British and U.S. forces landed on beaches between Licata and Cassibile in the early hours of July 10, 1943.

Within two days 8th army troops were in possession of the S.E. coast from Cape Passero to Augusta, Syracuse becoming the army's main supply base, while from Pachino airfield close fighter support was given to the troops as they advanced. The U.S. 7th army secured Gela and Licata on the W. coast and beat off the first German counter attack.

The 8th army advanced N. towards Catania along the coast and inland towards Caltagirone and Enna. The Germans, realizing the threat to Messina and their communications with Italy, transferred the bulk of their forces E., holding up the capture of Catania, and of the airfields near Gerbini,

in the plain of Catania, and delaying the advance on Vizzini. The 7th army, against only slight opposition, thrust N. to Caltanissetta and on towards Palermo, capital of Sicily, captured July 22. The Americans entered Marsala next day, Trapani on the 24th.

Only N.E. Sicily remained in enemy hands. There Mt. Etna with its foothills dominated the approach to Messina from the S. and the mountainous country abounded in formidable natural obstacles, made more difficult by skilful demolition. At the same time, the Mount Etna bastion afforded excellent sites for the observation of every movement of the British forces.

Conquest of Sicily Completed

Having cleared W. Sicily, the Americans were able to turn E., and as they advanced on Nicosia, Troina, and Randazzo W. and N. of the Etna bastion, 8th army made an attack outflanking Catania. Centuripe, most formidable strong point on the road from Catania to central Sicily, was stormed on Aug. 2 by the British 78th div. in one of the outstanding actions of the Sicily campaign. When Centuripe fell, the fall of Adrano, key to the whole Etna bastion, was certain. The Germans withdrew from Catania on the 5th. Canadians captured Adrano on the 7th, Americans took Troina on the 6th and Randazzo on the 13th. The whole of Etna was in Allied hands by the 14th. But wholesale demolition delayed 8th army's advance, and to speed the enemy's retreat, on Aug. 16, a commando landing was made at Scaletta, eight m. S. of Messina, while an American amphibious force landed beyond Milazzo on the N. coast, about eight m. W. of Messina. The Americans entered the city the same evening, the British early next morning, and the campaign was over. It had taken 38 days instead of the 90 for which the Allies had been prepared. In it the Germans had lost at least 23,000 killed and wounded, the Italians between 7,000 and 8,000; 8th army casualties were 11,853, 7th army's 7,500.

The Sicily campaign was the first in which troops were maintained over open beaches for a considerable period. The Bailey bridge (*q.v.*) proved itself the outstanding road-engineering achievement of the war; while valuable lessons in administration and maintenance of armies over mountainous country with limited road and port facilities were gained

The rapid conquest of Sicily had been a severe shock for the Italians, and was responsible for their surrender on Sept. 3, the day Montgomery's reconstituted 8th army landed at Reggio di Calabria. Opposition was slight and no mines or demolitions were encountered. In a week the strait of Messina was under Allied control. On Sept. 9 the 5th army, composed of U.S. and British troops commanded by the U.S. Lieut.-Gen. Mark W. Clark, landed in the gulf of Salerno: this was the main Allied descent. On the same day a British naval force entered Taranto harbour and landed British troops of the 1st airborne div., who reached Brindisi two days later; both these important ports were secured intact.

The Salerno landing encountered bitter resistance and for three days was in danger of being thrown back into the sea; but reinforcements, including armour, were landed by sea and air, while fire from Allied naval vessels broke up enemy tank attacks, and by the 15th the position had been consolidated. Pressure on the Salerno front was relieved by the advance of 8th army. Canadian troops took Crotone port and airfields on the 12th, the British reached Cosenza on the 13th. On the 16th 8th army was at Vallo, and next day made contact with 5th army at Agrapoli, on the S. side of the gulf of Salerno. The Canadians took Potenza on Sept. 21. Hard fighting continued around Salerno, but by the end of the month the Americans were in Avellino, on the mainland E. of Naples. The Allies now held a line across Italy to the Gargano peninsula, having taken the important Foggia airfields, from which not only could German objectives in Italy be attacked, but also long-range bombers could be sent to strike at Germany's war industries in central Europe, and at objectives in the Balkans.

Allied Entry into Naples

The Germans drew out of Naples on the night of Sept. 30 - Oct. 1, and at 8 a.m. on the 1st, 5th army entered the city, to receive a frantic ovation. The spiteful ingenuity of the Germans had augmented destruction in the city and harbour far beyond legitimate military demolition, and included delayed action bombs, one in the basement of the G.P.O. and another in a barracks in the centre of the city, which exploded on Oct. 7 and 10 respectively, both causing a number of deaths. The harbour was unusable, but three weeks' work

by Allied engineers brought it into service again.

A Royal Marine commando landed just S. of Termoli on the Adriatic on the night of Oct. 2-3, and by nightfall the town was in its hands. A month later 8th army crossed the Trigno, and the enemy fell back to the N. of the river Sangro. As they retreated, the Germans destroyed all bridges behind them. Moreover, the rivers were now in flood, and the engineering feats performed by Allied engineers under fire in getting bridges across the flooded rivers called for both courage and technical skill.

Advance towards Cassino

The 5th army meanwhile had pushed on to the Volturno, across which Clark launched a full-scale attack on the night of Oct. 12-13. Resistance was determined, but by the 16th the enemy had been pushed back from the river line, and the Allied force on the W. continued to advance slowly against determined resistance towards Cassino, the strongest point in the so-called Gustav line (*q.v.*), which lay astride the road to Rome.

During the night of Nov. 27-28 Montgomery attacked across the Sangro. Enemy resistance was bitter, for the Germans had fortified the high ground beyond that river as a continuation of the Gustav line. The ridge was in British hands by noon on the 30th.

The difficult nature of the country to be traversed, and the urgency of securing Rome at the earliest possible moment, led the Allied high command to decide on an amphibious operation in the rear of the enemy's fortified line; but the impending invasions of N. and S. France made a heavy call on available landing craft, limiting the amount that could be spared to the Mediterranean command, and the time that it could be left there. A plan to land at Anzio on Dec. 20 had to be abandoned owing to the slowness of 5th army's advance.

A new attack on the night of Jan. 4-5, 1944, brought Allied forward troops to within three m. of Cassino, and on Jan. 7 the landing was set for the 22nd. The assault force of 50,000 British and U.S. troops and more than 5,000 vehicles was put ashore against negligible opposition, and by the evening of the 23rd both Anzio and Nettuno were in Allied hands intact. But Hitler issued a special order that the Gustav line must be held at all costs, and the German defence of Cassino stiffened.

At the same time Kesselring, c.-in-c. of the German forces in Italy, built up a strong force whose sustained efforts throughout Feb. to wipe out the Allied beach-head at Anzio met with stubborn resistance. The beach-head was maintained, but it was contained by the enemy.

For the course of the battle for Cassino, which resolved itself into a struggle for possession of the hill of that name dominating the town, see Cassino. Not until Monte Cassino was in Allied hands on May 18, and with it the whole Gustav line, were the Allied forces able to make further headway. The Germans withdrew to the Hitler line across the Liri valley, but a concerted attack coming from the main 5th army front and the Anzio beach-head forced the enemy out of that line too by May 25, on which day troops from Anzio and Cassino met near Borga Grappa.

Allies enter Rome

The Germans were now retreating rapidly. They drew off to the N. of Rome, and on June 4 Allied forces entered the capital. Strenuous efforts were made by the Allies to terminate the Italian campaign before the onset of another winter. With equal determination the Germans, with fascist Italian units, fought to hold the industrial N. At first the Allied armies followed swiftly after an enemy retreating in disorder. But the weakening of Allied strength by the withdrawal of some six divs. during June and July (in preparation for the landing in S. France), German reorganization, and the exceedingly difficult country in the mountainous backbone of Italy soon slowed down the advance. Pescara (June 10), Terni (June 15), Perugia (June 19), Siena (July 3), Ancona (July 18), Leghorn (July 29) fell in succession. Florence was occupied on Aug. 21. Pisa, at the W. end of the Gothic line, next German prepared defences, was captured Sept. 2; but Rimini at the E. end did not fall until Sept. 21, after nearly a month of bitter fighting in the environs. The capture of the Futa pass, centre pivot of the line, two days later, destroyed the line's effectiveness; but by that time torrential rains were falling, and major operations ceased until the spring.

The Allies had now left the mountains behind and entered a region intersected by streams and canals. Forlì was captured on Nov. 5, Ravenna on Dec. 5,

Faenza on Dec. 16. A German attack in Tuscany on Dec. 26, intended to coincide with Rundstedt's break-through in the Ardennes, but, launched when that attack had spent itself, forced 5th army to abandon some ground.

Unconditional Surrender

Then in April the Allies launched a heavy two-pronged attack on Bologna, entered simultaneously on April 21 by troops of the 8th army from the E., of the 5th army from the S. and W. Ferrara and Modena fell to the 8th army on April 24; and the same day the 5th army entered the naval base of Spezia on the Ligurian Sea. Italian patriots rose, and secured control of Genoa, Milan, and other big cities of the N. The 5th army reached Genoa on the 27th, and on April 29 Col.-Gen. von Vlietinhoff-Scheel, Kesselring's successor, unconditionally surrendered to F.-M. Alexander, Allied c.-in-c., all German and fascist Italian forces in N. Italy and W. Austria. The surrender was made public on May 2, when it came into force.

Spearheads of the 5th army reached the Swiss frontier at Chiasso on April 29. New Zealand troops crossed the Isonzo May 1, and received the surrender of the German commander in Trieste on May 2. U.S. troops of the 5th army made contact near the Brenner pass with troops of U.S. 7th army from the N. on May 4.

Italy Star. A British military award instituted May 18, 1945, for any period of service in Sicily or Italy between June 11, 1943, and May 8, 1945. The ribbon is in Italian colours, green, white, and red, with five vertical stripes of equal width, red at either edge, green in the centre. The star is identical in shape and composition with the other campaign medals of the Second Great War. See Campaign Stars; Medals col. plate.

Itapua. Dept. in the S.E. of Paraguay. It is watered by the Paraná and tributaries, and is one of the most fertile and best cultivated districts of Paraguay, the principal product being fruit. The capital is Encarnación (*q.v.*) on the Paraná. Pop. 25,000.

Itatiaya. Highest mountain in Brazil. It is the loftiest peak, 10,300 ft., of the Serra da Mantiqueira, between the provs. of Rio de Janeiro and Minas Geraes.

Itch. Irritation of the superficial sensory nerves of the skin or mucous membrane, resulting in a compulsion to relieve it by scratching. It may be directly caused

by an exudation of the serous content of the blood through unhealthy vessel walls, as in chilblains; or by an alteration in the chemistry of the blood, such as a changed calcium content when too much juicy fruit is eaten. Another type of itch results from the bites of many blood-sucking insects, which introduce a chemical to render the blood less viscid and so more easily withdrawn by the proboscis. Vague itching is often associated with a depressed nervous state. Abnormal skin sensations characterise some cases of drug addiction. Itch is almost always a feature of severe jaundice. An external cause may be dust from factory work alighting on the skin. The cause may be mechanical, as in scabies or pediculosis.

Urticaria (nettle-rash) is due to some foreign protein, usually deriving from shellfish or eggs, making its way past the barrier of the liver, and is common in allergic subjects, often in the presence of a chronic septic focus. Another reason for itch is degenerative change in the tissues, usually in the older patient. Pruritus of the anus and vulva are well known to physicians.

Prolonged itch is more shattering to the nervous system than is pain. Tickling the soles of the feet, leaving no mark on the victim, was a favourite torture in history, revived in the Second Great War. The treatment of itch is essentially the cure of the causative condition. Mechanical irritations must be dealt with, and degenerating tissues treated by X-ray and suitable glandular therapy. A saline purge, the slow injection of large doses of calcium into a vein, the prescribing of an intestinal absorbent, are useful where the cause is a disturbance of the body chemistry, when the application of carbolic or weak cocaine to deaden sensation, or the injection locally of adrenalin, are indicated. Injection into a muscle of the patient's own blood often gives relief, though the reason is not clear. Histamine derivatives have a special value in allergic itches. At all costs itch must be controlled.

Hilary Ledgerwood, M.B.

Itchen. A river of Hampshire, England. Rising near Alresford in the centre of the co., it flows W. and then S. to Southampton Water, passing Winchester. It enters the sea by a tidal estuary of 3 m., and gives its name to an E. suburb of Southampton. Itchen Abbas is a village on the river, 5 m. N.E. of Winchester.

Another Ithen, in Warwickshire, is a tributary of the Avon.

Ithaca (mod. Itháki, Thíáki). One of the Ionian islands, belonging to Greece. In ancient times it was regarded as the home of Odysseus (Ulysses). Seventeen miles long, with an area of 45 sq. m., it is traversed by a ridge of limestone rock, and its coasts are steep and rugged. Vines, currants, and olives are grown; while goat rearing and sponge and coral fisheries form the chief occupation of the inhabitants, 5,100 in number. The island is cut almost in halves by the Gulf of Molo, on which stands the capital, Vathy. Some consider the ancient Ithaca a fictitious island, others find it in Leucas, but the general opinion favours its identification with one of the Ionian islands. *See* Greece.

Ithaca. A city of New York, U.S.A., the co. seat of Tompkins co. At the head of Cayuga Lake, 58 m. S.W. of Syracuse, it is served by rlys., an airport, and the state barge canal. In the centre of the Finger Lakes country, it is near three state parks, in one of which is the highest single waterfall E. of the Rockies, with a drop of 215 ft. Ithaca is the seat of Cornell university (*q.v.*), which specialises in scientific and agricultural projects, and Ithaca college, a centre of dramatic art and physical education. Industries include the manufacture of firearms, electrical apparatus, clocks, paper, cement, adding machines, leather goods, and salt. Settled in 1787 and originally called The Flats, Ithaca was incorporated in 1821, and became a city in 1888. Pop. 19,730.

Ithōmē. A mt. fortress in Messenia, ancient Greece. The seat of the cult of Zeus Ithomatas, during the first Messenian War (743–724 B.C.) Ithōmē distinguished itself by its heroic resistance to the Spartans, and in the third (464–455) endured a ten years' siege. In 369 it became the acropolis of the new town of Messēnē built at its foot by Epaminondas, when he restored the Messenian state.

Itinerary (Lat *itinerarium*). A gazetteer of ancient Roman roads compiled for the use of travellers, especially those making journeys in an official capacity. Some were in writing only, others contained maps. The extant Itineraria Antonini belong to the former class.

Ito, HIROBUMI, PRINCE (1841–1909). Japanese statesman. Born in Choshun province, he made his way to London in 1861, and after two years in Europe returned to

Japan, where, against much opposition, he set himself to introduce European civilization and methods. In 1878 Ito became minister of the interior, and in 1886 premier for the first of four terms. On Feb. 11, 1889, the constitution, drafted by himself, was issued.

The war against China in 1894–95 was brought to a successful finish under his administration. He was largely responsible for the Japanese alliance with Great Britain, 1902; and through his diplomacy Japan obtained control of the foreign affairs of Korea, where Ito was appointed resident general in 1906. Next year he was made a prince. He was assassinated at Kharbin, Oct. 26, 1909. A Life by K. Hamaka appeared in 1937.

It's Never Too Late to Mend. Novel by Charles Reade, first published in 1856, with the sub-title A Matter of Fact Romance. Full of passionate purpose in its exposure of the evils of prison life in England and Australia, the story is somewhat melodramatic. Its realistic presentation of the life of the Australian goldfields, vivid descriptions, and general vigour gave the book great popularity, which was shared by the author's dramatised version produced at The Princess's, Oct. 4, 1865.

Iturbide, AUGUSTIN DE (1783–1824). Emperor of Mexico 1822–1823. Born at Valladolid (later Morelia), Sept. 27, 1783, he was the son of a nobleman who had recently migrated from Navarre. As a youth he entered the army, and fought for the Spaniards in the insurrection of 1810. In 1815 he was for a short time governor of the provinces of Guanajuato and Michoacan, and then left the army. When the constitution of 1812 was proclaimed in 1820 he was given command of the Spanish army of the south, but at once began intriguing with the revolutionaries, and in 1821 issued a proclamation, the plan of Iguala, demanding complete independence. He forced the viceroy to sign a treaty agreeing to the plan, and was proclaimed



Prince Ito,
Japanese statesman

emperor as Augustin I, May 18, 1822. His despotic rule led to rebellion and in March, 1823, he abdicated and went to Europe. He returned to Mexico in July, 1824, but having been outlawed was arrested, and shot at Padilla, July 19. *Pron.* Ee-tur-beeday.

Iturea. An ancient division of Syria, between Damascus and Lake Tiberias and bordering on Arabia. The Itureans were Arabians and a warlike people. Many entered the Roman army as archers, afterwards forming cohorts and the Iturean guard. *See* Syria.

Itzehoe. A town of Holstein, Germany. On the navigable river Stör, it is 32 m. N.W. of Hamburg, amid the fertile Wilster marsh; it is a rly. junction, port, and the seat of numerous hospitals and sanatoria. Nets, soap, machinery, cement, wood, sugar, and a cattle market provide the industries. Itzehoe developed around a castle built by Charlemagne against the Danes, had urban rights from 1238, and from 1835 to 1864 was capital of Holstein. Pop. 21,435.

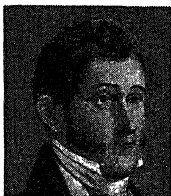
IVAN OR JOHN. Name of several rulers of Russia. Ivan I was grand duke of Moscow, 1328–41, under the suzerainty of the khan of the Tartars. He transferred the metropolitan see from Vladimir to Moscow, and was the first to attempt to unite the smaller states of Russia. *Pron.* Ee-vahn.

Ivan III (1440–1505). Grand duke of Muscovy 1462–1505, surnamed the Great. The real founder of the tsardom of Muscovy, he made himself independent of Tartar control, greatly extended his territories, organized civil and military affairs, and drew up a *sudebnik* or code of laws supplementing the code of Yaroslav. He also entered into commercial and diplomatic relations with the Western powers. He married Sophia Palaeologus, niece of the last East Roman emperor, from which time the two-headed eagle appeared in the Russian arms.

Ivan IV (1530–84). A tsar of Russia 1547–84, surnamed the Terrible. Grand duke from 1533, he threw off the regency at 14 and on Jan. 16, 1547, was proclaimed tsar, the first Russian to assume that title. He made himself master of Kazan, Astrakhan, and W. Siberia, and did his utmost to undermine the influence of the boyars. But



Ivan the Terrible,
Tsar of Russia



A. de Iturbide,
Emperor of Mexico

attempts to obtain possession of the Baltic provinces were frustrated by the opposition of Sweden, Denmark, and Lithuania. Ivan was the first Russian ruler to conclude a treaty with England.

Soon afterwards Ivan withdrew from Moscow and lived in retirement, surrounded by his *oprichniki* or bodyguards, varying a life of cruelty and debauchery with strict religious observances. Towards the end of his reign hostilities with Sweden, Norway, and Poland would have cost him the throne had not Gregory XIII intervened. In a fit of passion he killed his son Ivan in 1580, and remorse for the deed is said to have hastened his end, which came on March 18, 1584. A Life by Stephen Graham appeared in 1932.

Ivanhoe. Tenth of the Waverley novels and the first in which Scott laid the scene outside Scotland—in Yorkshire and Leicestershire. The period is that of the return of Richard I from the holy land. The character drawing, the thrilling description of the tournament at Ashby-de-la-Zouch, and the scenes in Sherwood make this dazzling panorama of feudal England a lasting favourite. Published in Dec., 1819, the novel has provided material for seven dramas, seven operas—one by Sullivan—and two extravaganzas.

Ivanov, VIACHESLAV IVANOVICH (1866–1949). Russian poet. Born in Moscow, he studied in Berlin under Mommsen, and in Geneva, Athens, Rome, and London. Works on early Greek religion appeared in 1904. Then he became a leader of the Russian symbolist movement, publishing from 1909 a series of books of poetry highly influential in Russia. Several of his poems were in praise of the N. Cornish coast; he also translated into Russian Dante, Petrarch, and Byron. He held the chair of classical philology at Baku, 1920–24, when he was allowed to leave Russia. He settled in Rome, where he died July 17, 1949.

Ivanovo. Town of R.S.F.S.R. It is in the region of Ivanov, 65 m. N.E. of Vladimir, on the Uvod and the rly. from Vladimir to Kineshma, with connexions to Moscow and Gorky. Ivanovo on the N. bank of the river and Voznesensk on the S. bank were incorporated as one town in 1871. It has been called the Russian Manchester. There are calico printing and chemical and machinery works in the town; also large cotton factories and ironworks in the town and the immediate

neighbourhood, which is among the most important manufacturing centres in Russia. Pop. 285,000.

Iveagh, EDWARD CECIL GUINNESS, 1ST EARL OF (1847–1927). British brewer and philanthropist. Born Nov. 10, 1847, a younger son of Sir Benjamin Guinness, he was educated at Trinity College, Dublin, and joined the great Dublin firm, becoming its head on the retirement of his elder brother, Lord Ardilaun. He established in 1889 the Guinness Trust for building houses in London and Dublin, subscribed £250,000 to the Lister Institute, and paid for various improvements in the Irish capital. In 1908 he was made chancellor of Dublin university. In 1885 he was made a baronet, in 1891 a baron, in 1905 a viscount, and in 1919 an earl. His sons, Rupert (*v.i.*) and Walter, were both noted oarsmen at Eton and Cambridge, afterwards sitting in the house of commons. Lord Iveagh died on Oct. 7, 1927. By his will, which was proved at £11,000,000, he left Ken Wood (*q.v.*), Hampstead, with a magnificent collection of pictures, to the nation.

Rupert Edward Cecil Lee Guinness (b. March 29, 1874) succeeded to the title. He was Unionist M.P. for Haggerston 1908–10; S.E. Essex, 1912–18; Southend, 1920–27. When he went to the lords his seat at Southend was held from 1927 to 1935 by his wife Gwendolen, daughter of the 4th earl of Onslow. He was chairman of the firm of Guinness and chancellor of Dublin university. *Prom.* Ivah.

Ivel. A river of Somerset, England, which is sometimes known as the Yeo. It is a tributary of the Parret, and Yeovil is the most important town on its course.

Ives, FREDERIC EUGENE (1856–1937). American inventor. Born Feb. 17, 1856, and apprenticed in his youth to a printer, he became manager of the Cornell university photographic laboratory, where in 1878 he invented a half-tone photo engraving process from which he evolved in 1886 the process now generally employed. He also invented the three-colour process of colour printing, which revolutionised the art printing industry. He died in Philadelphia, May 27, 1937.

Ivinghoe. A market town and parish of Bucks, England, 4 m. from Tring rly. station and 2 m. from Cheddington station. Its 13th century church, a cruciform edifice dedicated to S. Mary, is noteworthy. There is a market house, and cattle fairs are held.

A Benedictine nunnery stood here before the Reformation. It is supposed that from here Scott took the name of Ivanhoe. Ivinghoe Beacon (*see* Chiltern Hills *illus.*) is near the town. Pop. 763.

Iviza, IBIZA, or IVIQA. Spanish is. in the Mediterranean, westernmost of the Balearic Islands, 59 m. E. of the Spanish coast. Its area is about 229 sq. m. It is hilly and wooded, with an indented coast, a good climate, beautiful scenery, and fertile soil, and produces corn, oil, figs, prickly pears, almonds, salt, charcoal, and lead. The pop. is scattered, the only important town being Iviza, the capital. The island was formerly celebrated for its pine trees, and with the neighbouring I. of Formentera was known to the ancients as Pityusae (pine islands). Pop. 25,436.

Iviza or LA CIUDAD. Capital of Iviza, Balearic Islands. It has an old castle built by Philip V, and a 13th century cathedral. Iviza exports fruit, salt, and lead, and manufactures hosiery. It is the ancient Ebusus. Pop. 6,700.

Ivory. Name given to a variety of dentine or tooth substance of various animals. Ivory proper is usually restricted to that obtained from the tusks of elephants, but that from the hippopotamus, narwhal, and walrus, is also recognized. The finest comes from the tusks of the African elephant; it is whiter and of greater density than any other, and tusks weighing over 200 lb. each have been obtained. The tusks of the Indian elephant are considerably smaller, the average weight being 50 lb. These are the two chief sources of the ivory of commerce, but much is obtained from the tusks of fossil elephants from Siberia, China, etc., and the teeth of walruses, etc. Nearly all the world's ivory supply is marketed in London, Liverpool, and Antwerp.

Ivory, on account of its hardness, whiteness, durability, and ability to take a high polish, has been from the earliest times a favourite article of ornament. Though not easy to cut, it can be sawn and filed, and softened and made flexible by immersion in phosphoric acid and afterwards in hot water. It can be dyed by various chemical means, but no method has yet been discovered of restoring its colour when yellowed with age. Its principal commercial use is for ornamental carving, piano keys, billiard balls, knife handles, and toilet ware.

The steadily increasing demand for ivory and the decreasing supply



Ivory. Consignment from Uganda, some of the tusks being 10 ft. in length and weighing 140 lb.

have resulted in the manufacture of substitutes, chief of which are celluloid and vegetable ivory; but no substitute, has the resonance or takes the peculiar high polish of ivory. See Africa; Cellulosic Plastics; Comb; Elephant; Ivory Nut.

Ivory Black. A pigment prepared by calcining ivory in a closed crucible. The access of air must be prevented or the ivory will be reduced to a white powder. The material employed is the waste resulting from ivory working. This is a rare pigment, most so-called ivory blacks being the finest varieties of bone-blacks.

Ivory Coast. French colony in West Africa. It is bounded N. by the French territories of Upper

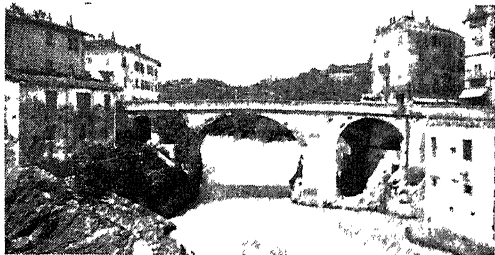
which are navigated by small steamers forming an excellent means of coastal transport. Well timbered, the forest area covers 74,000 sq. m. Rains are heavy from April to July in the S. and from June to Sept. in the N.

The pop. may be divided into three principal groups: Agnis, of the same family as the Ashantis; Mandes, who are generally Mahomedans but preserve many former practices; and Krumen, in the S.W. of the colony. The Ivory Coast has a pop. of 4,000,000, covers 180,000 sq. m., and is administered by a lieutenant-governor subject to the governor-general of French West Africa. Since 1920 the capital has been Abidjan, whence a rly. has been constructed to the Upper Volta border towards Bobo-Dioulasso. Abidjan, Bingerville, Grand-Bassam, Buake, Mau, and Korhogo are commercial centres. Tabou has a wireless station and Sassandra a small port. The exports are coffee, cocoa, precious woods, palm oil, and bananas.

Ivory Nut OR VEG-ETABLE IVORY (*Phyt-elephas macrocarpa*). Dwarf tree of the family Palmae, native of the north of S. America. The greater part of the trunk (perhaps 20 ft.) lies

along the ground, with only a few feet vertical. It is crowned by grand feather-like leaves, 15 ft. to 20 ft. long. The male plant grows taller than the female, and the flowers are crowded around a long, drooping stalk (spadix), so that they resemble a catkin. In the female plant the spadix bears only six or seven flowers, which are succeeded by a cluster of plum-like fruits consisting of a sweet yellow pulp, enclosing from six to nine seeds, and covered with hard protuberances. The seeds, at first milky, harden into the condition known as vegetable ivory, used as a substitute for the elephant's tusk in making chessmen, reels, knobs, and toys.

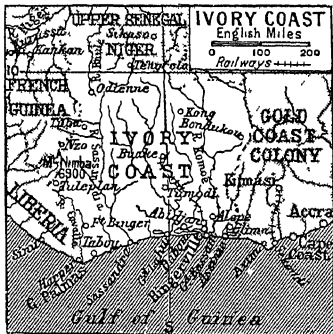
Ivrea. City of Italy, in the prov. of Aosta. It stands on the Dora Baltea, 38 m. by rly. N. of Turin. The restored cathedral dates from 973-1005. The hill (800 ft.) on which Ivrea stands is crowned by the Castello delle Quattro Torri, 1358, now used as a prison. Only three of its lofty brick towers remain standing. There are iron and dye works, cotton and silk manufactures, and a trade in cereals,



Ivrea, Italy. Roman bridge across the river Dora Baltea

fruit, and wine. Colonised by the Romans about 100 B.C., Ivrea contains ruins of a theatre and other antiquities. It fell to the French in 1554, 1641, and 1704. It is the ancient Eporedia.

Ivry, BATTLE OF. Fought between Henry IV of France and the forces of the Catholic League, March 13, 1590. Henry, fighting for his throne, set out to clear his foes from Normandy. He was besieging Dreux when the Leaguers, under the duke of Mayenne, marched towards him. With them was a contingent of Spaniards from the Netherlands, and Henry prepared to meet them near Ivry on the Eure, 42 m. W. of Paris, and now known as Ivry-la-Bataille.



Ivory Coast. Map of the French colony on the Gulf of Guinea, W. Africa

Volta and Sudan, W. by French Guinea and Liberia, S. by the Gulf of Guinea, and E. by the Gold Coast. The only highlands of importance are on the borders of Liberia, where Mount Nimba exceeds 6,000 ft. The coastal regions are broken by lagoons,



Ivory Nut. Foliage and fruit, with open nut on right

Henry arrayed his infantry, Germans and Swiss among them, in line. Some he placed in front, with the artillery; behind were horse and foot intermingled on a regular plan, Henry being with the horse in the centre. Mayenne's troops crossed the Eure, and his Spanish horse charged, but on the wings the Leaguers met with no success. In the centre they almost overwhelmed Henry, but the king rallied and personally led a fierce charge against Mayenne's infantry, who broke before the shock. The fight was almost entirely a cavalry engagement. The king ordered his men to spare the French, but to slay all foreigners except the Swiss, who were present on both sides. Henry is estimated to have had about 11,000 men against 22,000. The battle is the subject of a ballad by Macaulay.

Ivry-sur-Seine. A suburb of Paris, in the dept. of Seine. It lies on the left bank of the Seine, $4\frac{1}{2}$ m. S.S.E. of Paris, immediately outside the fortifications, and is connected with the city by electric rly. On the river bank, above the Pont de Conflans, is a harbour for river traffic, the Port d'Ivry. Fort d'Ivry forms part of the inner zone of Paris fortifications. Pop. 42,445.

Ivy (*Hedera helix*). A climbing shrub of the family Araliaceae, native of Europe, N. Africa, and Asia. In old specimens the trunk may be as much as 1 ft. thick. Ivy reaches to the tops of tall trees and buildings, clinging to its support by peg-like rootlets. The thick, glossy leaves have five lobes, which vary greatly in depth and the acuteness of their points; the upper leaves are oval or heart-shaped, without lobes. The yellow-green flowers grow in umbels, and are produced from Sept. to Nov. The fruit is a small, dull bluish-black berry.

Variegated ivies are useful in gardens to cover ugly corners, and to trail over tree stumps, etc. They should be planted in autumn in ordinary rich soil. When a check in growth or habit is desired it should be effected by vigorous pruning with shears in early spring. Ivy may destroy trees if allowed to grow over them unchecked for a considerable period. See Inflorescence.



Ivy. Foliage and flowers of this climbing shrub

Ivybridge. Urban district of Devon, England. Situated near Dartmoor, about 10 m. E.N.E. of Plymouth, it is served by the G.W.R. Agriculture and dairy farming are the chief industries, but there are also paper mills. Pop. 1,600.

Iwakura, TOMOMI, PRINCE (1835-83). Japanese statesman. Born in Kyoto, of noble family, he held a court position, and was at first opposed to all foreign influences; but in 1868 he took an active part in the revolution which brought the progressive party into power. To his efforts was due the abolition of the feudal system, while as foreign minister he showed great shrewdness and ability, although it is reported that he never saw a foreigner until he was of middle age. His embassy to the Western powers in 1872 to explain the aspirations and new conditions in Japan was brilliantly executed, though it met with scant success. He was a strong advocate of peace.

Iwojima. Centre island of the three that comprise the Volcano Is. in the Pacific Ocean, 750 m. S. of Tokyo. A small, bare, leg-of-mutton-shaped island, 5 m. long, covered with volcanic ash, it was occupied in 1891 by the Japanese, who developed its sulphur mines.

During the Second Great War Iwojima was a Japanese air base.

U.S. carrier-borne aircraft attacked the island on June 23, 1944, and thereafter it was subjected to periodic naval and air bombardment. In 1945 it became necessary to secure Iwojima because Japanese aircraft operating from it were intercepting U.S. super-fortresses in passage between the Mari-

anas and Japan. After a three days' bombardment of the island from the sea and the air, U.S. marines landed on Feb. 19, 1945, to meet on the shelterless beaches much stiffer opposition than had been expected. Mt. Suribachi, 500 ft., keypoint in the defence and highest point on the island, from which every movement of the invaders could be observed, was taken after hard fighting on the 23rd; but not until March 16 did organized resistance end, the Japanese defending every cave—and the island was full of them—to the death. U.S. marine casualties

were 4,189 dead, 441 missing, 15,308 wounded. Japanese losses were estimated at 21,000, plus 700 prisoners.

The capture of Iwojima made possible a fighter escort for super-fortresses raiding Japan, and a landing ground for damaged U.S. aircraft returning to the Marianne Is from Japan. See Pacific War.

Ixelles (Flemish, *Elsene*). Suburb and commune of Brussels, Belgium. It lies to the S.E. of the Boulevard de Waterloo, adjoining the Quartier Léopold on the N.E.

Ixia. Genus of bulbous herbs of the family Iridaceae, natives of S. Africa, with narrow sword-shaped leaves, and spikes of showy, salver-shaped, tubular flowers, varying through white, pink, and rose to dark red and blue, or cream colour to orange.



Ixia. Flowers of this South African herb

Ixiolirion montanum. Bulbous herb of the family Amaryllidaceae. A native of Asia, it has grass-like leaves and a spray of trumpet-shaped blue flowers. There are several garden varieties.

Ixion. In Greek mythology, king of the Lapithae in Thessaly. Having murdered his father-in-law, he was taken to heaven by Zeus for purification, no mortal



Ixion bound to his wheel in the nether world
From an old engraving

being able to purify him. For attempting the virtue of Hera, wife of Zeus, he was condemned to be bound to a continuously rolling wheel in the nether world.

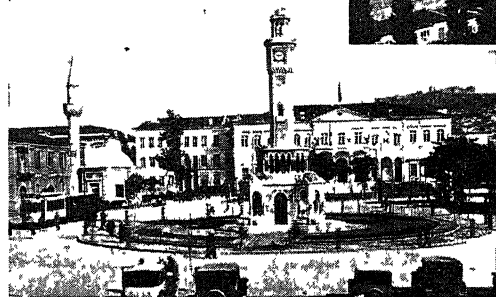
Ixora. Large genus of shrubs of the family Rubiaceae. They are natives of the tropics, chiefly



Ixora. Foliage and flowers of *I. coccinea*

of Asia and Africa. They have leathery, opposite leaves, and clustered, showy, tubular flowers of white, pink, salmon, orange, or crimson, often fragrant. *I. coccinea* is credited with medicinal properties by the natives of India, who use the beautiful flowers as offerings to one of their deities.

Iztaccihuatl (white woman). Extinct volcano of Mexico, in the state of Puebla. It is 40 m. S.E. of Mexico City and on the S. adjoins Popocatepetl, being connected by the saddle of Tlamacas. Covered with snow, its profile as seen from



Mexico City resembles a woman reclining in a white shroud. Its alt. is about 17,000 ft., and the ascent is rarely accomplished.

Izalco. Volcano in the republic of Salvador, about 6,000 ft. high, and the most active volcano in Central America. Much of the time its flames illumine the countryside and are marked by vessels on the Pacific as a natural guide.

Izar. Second month of the Jewish year, corresponding approximately to May. See Calendar.

Izdubar. Hero of Babylonian mythology, more generally known as Gilgames or Gilgamesh (*q.v.*).

Izhevsk. The capital of the Urdmurtsk A.S.S.R., Russia. It stands on the Izba, 40 m. N.W. of Sarapul. Here is an establishment

for the manufacture of firearms, founded 1760. Breweries, brick-works, sawmills, and flour mills employ others of the pop. of 175,740.

I Zingari (Ital., the gipsies). Touring cricket club, known also as I.Z. It was founded in 1845, playing some of its early matches at Canterbury, where the Old Stagers (closely associated with I.Z.) still take part in the annual cricket week. Members in a normal season play about 30 matches, although they have no home ground. *Pron.* Ee Zing-g'ri.

Izmir (SMYRNA). Seaport of Asiatic Turkey and ancient city of Asia Minor. Standing on the W. coast, at the head of the Gulf of Izmir (which penetrates 46 m. inland from the Aegean Sea), it lies at the foot of Mt. Pagus, here crowned



Izmir, Asiatic Turkey. General view, from the south, of the port and city, formerly known as Smyrna. Left is Konak Square

by the ruins of the ancient Greek acropolis; it is the capital of the vilayet of the same name (formerly part of Aidin).

Known through history as Smyrna, it was founded by Greek colonists about 1000 B.C., and was one of the seven cities associated with Homer. Destroyed by the Lydians in 627 B.C., and restored by Lysimachus three centuries later, it became a prosperous city under the Romans. During the Middle Ages it was frequently sacked by the Turks; partly occupied by the Knights of Rhodes in 1344; destroyed by Tamerlane in 1402; and finally captured by the Turks in 1424.

One of the seven churches mentioned in the Book of Revelation, it has been associated with Christianity from the beginning, and was formerly the seat of Roman Catholic, Greek Orthodox, and Armenian archbishops.

The commercial prosperity which Smyrna enjoyed during the 19th century was greatly reduced by the Balkan Wars, 1912-13, and the First Great War. Occupied by the Greeks in 1919, it was retaken by the Turks, Sept. 9, 1922. Four days later a great fire destroyed three-fifths of the town. The new city, of wide streets, gardens, and squares, is an important rly. terminus. Possessing a fine harbour, it is one of the chief distributing centres of the tobacco industry; it trades in corn, raisins, figs, wool, skins, oil, and silk, all of which are exported. Carpet, cotton, silk, and soap factories, tanneries, iron, saw, and flour mills, formerly owned by Armenians or Greeks (who were deported after the treaty of Lausanne in 1923), are among

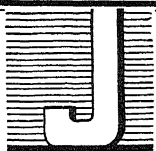
its numerous industries. Pop. 200,088; vilayet, 675,986.

Izu-Shichito OR THE SEVEN ISLANDS OF IZU. Group of Japanese islands, in U.S. occupation from 1945. They extend south into the Pacific, S. of the entrance to Tokyo Bay. Oshima or Vries Island is the largest; others are Toshima, Nijima, Kozushima, Miyake, Mikura, and Hachijo; also several small islets. All are of volcanic origin; Mikara, 2,500 ft. high, on Oshima, is subject to frequent eruptions.

Izvestia (Russian, news). The newspaper and official organ of the supreme soviet of Russia. Founded in 1917, it appears six days a week, and is distributed in all main cities and country districts of the U.S.S.R., publishing laws and decrees and official announcements. The usual edition is of four pages, reduced from six since the Second Great War; the first two pages are devoted to official matter, the others to foreign affairs, cultural articles, stage and film criticisms, etc. There are no advertisements.

THE history of the letter J is a short one.

This relatively modern offshoot of the letter I was unknown in any alphabet until the 14th century, when it originated in the ornamental lengthening of the letter I in MSS., particularly when it was an initial letter. The descendant stroke of the pen was made to taper away to the left. It happened that such an initial commonly indicated the consonantal sound of *y*, as in *yellow*; that is to say, the Latin pronunciation of either *Iulius* or *Julius* was as though spelt *Yulius*. Gradually the two letters I and J were differentiated to represent vowel and consonant respectively, though the



process of differentiation was slow. The letters were not separated in English dictionaries until the 17th century.

Whereas the minuscule, or lower case, *j* of modern type is derived directly from medieval MSS., the capital letter is virtually a printer's invention, and something of a makeshift. As with the capital U, there was no Roman model for the typographers to emulate, and both these letters are markedly inferior in design to the rest of the alphabet, lacking as they do the individual and collective balance, boldness, and dignity of the classic Roman capital letters.

J Tenth letter of the English and Latin alphabets. In the latter it is merely another form of I, which was both a vowel and a consonant (*y*). Its English value is that of *g* in *gem*. In French it is sounded approximately like English *si* in "fusion"; in Spanish like English *h*; in German like English initial *y*. See Alphabet; Phonetics.

Jabbercock. Mythical creature in a poem in Lewis Carroll's *Through the Looking Glass*. This poem, *Jabberwocky*, which puzzles Alice and is explained to her by Humpty Dumpty, has added to English slang some of its many nonsense words, e.g. *chortle*.

Jabbok (mod. Nahr ez Zerka). Stream in Gilead, in E. Palestine. One of the tributaries of the Jordan, and 110 m. long, it formerly separated the kingdom of the Amorites from that of Bashan, and had many associations with Jacob. His wrestling with the angel took place on its bank (Gen. 32).

Jabesh-Gilead. One of the chief cities in Gilead. Its inhabitants were slain for refusing to help the Israelites against the Benjamites (Judges 21), and Saul and his sons were buried close by the city (1 Sam. 31).

Jabiru (*Mycteria*). A genus of large birds of the stork family. They are found in India, Africa, Australasia, and S. America. Some

have almost naked heads and necks, and the beaks are large and massive. The legs are long, the toes comparatively short. The American species has white plumage, the African black and white, and the Indian glossy plumage with a metallic sheen.



Jabiru, the South American species

Jablonec. A town of Czechoslovakia, in Bohemia, also known as Gablonz (*q.v.*).

Jablonitz Pass. One of the chief passes of the Carpathians. Known also as Kőrösmezo (Magyar Gate) and Delatyn Pass, it is 3,300 ft. above sea level, and through it the rly. runs from Kolomea to Maramaros Sziget. In the First Great War the pass was the strategic gateway from Russia to the Hungarian plain. Fighting took place here between the Austrians and the Russians in 1915-16, and in the campaign of the Austro-Germans against Rumania, Dec., 1916-Mar., 1917.

Jaborandi (*Pilocarpus microphyllus* and *P. pennatifolius*). Brazilian plants from whose leaves is prepared the nitrate of an alkaloid pilocarpine. Preparations of pilocarpine stimulate the growth of the hair. Applied to the eye, pilocarpine causes contraction of the pupil.

Jaca. City of N. Spain, in the prov. of Huesca. On the southern slopes of the Pyrenees, 2,400 ft. above sea level, it is 114 m. by rly. N. of Saragossa. An episcopal see, it has a fine 11th century cathedral in Byzantine style. It was the capital of the county of Sobrarbe, from which originated the kingdom of Aragon. Modern Jaca owes its prosperity to its popularity as a mountain resort in summer. Pop. 6,900.



Jacamar of S. America

Jacamar (*Galbulidae*). Bird of tropical South America, related to the woodpecker. Somewhat resembling a large humming-bird, it has beautiful plum-

age, reflecting metallic hues. It feeds chiefly on insects, and nests in holes in river banks.

Jacaná (*Parridae*). Group of birds found in India, Australasia, and the tropical regions of Africa



Jacaná. Long-toed aquatic bird of the Tropics

and America. Including about ten species, birds of this group resemble coots, but are remarkable for their long legs and the extraordinary length of their toes, which enables them to walk on the floating leaves of large water-lilies. They feed upon insects, and make nests which float on the water or are placed near it. The birds fight con-

stantly among themselves.

Jachin (Heb., he shall establish). Name given to the fourth son of Simeon (Gen. 46, Ex. 6); and one of two symbolical bronze pillars which stood in front of Solomon's temple (2 Chron. 3). See Boaz.

Jacinth (Fr. *jacinthe*). Alternative name for a variety of zircon also known as hyacinth (*q.v.*).

Jack. A word used in many senses, some of which are noted separately. The most common is as a familiar term of endearment in lieu of John, derived from Jacken, a variant of Jankin, the regular diminutive of John. This nominal use appears in Jack Tar—the latter word an abbreviation of tarpaulin, in reference to the seaman's oilskins—Jack in the Green, Jack-a-dandy (a fop); Jack-sauce (an impertinent rascal); Jack Fool, Jack-a-Lantern (an *ignis fatuus*, also personified as Will o' the Wisp); Jack Frost, Yellow Jack (Yellow Fever), Jack-of-all-trades, steeple-jack, cheap-jack, and many others.

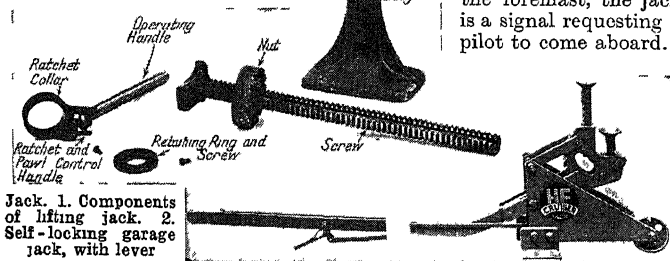
In an easily derived sense the word is applied to things which supplied the place of a boy-help, e.g. a boot-jack, roasting-jack to turn a joint, smoke-jack, and

thence to other purely mechanical appliances, such as the apparatus for raising weights (*v.t.*) and the upright rod which carries the quill or other plectrum that plucks the strings of a harpsichord. Its other use as a diminutive is equally easily explicable, as for a young, or small, pike, the small ball used in the game of bowls, and perhaps for the short beam known as a jack rafter.

Jack is a more recent name than knave for the lowest ranking picture card in each suit of playing cards, but as knave in the Middle Ages was used for a male child as well as a rascal, while jack in Shakespeare's day might mean a low fellow or menial, the similarity is apparent.

From yet another source, from a word found in French as *jaque*, in Italian as *giaco*, in Spanish as *jaco*, in Dutch as *jak*, and in German as *jacke*, comes the English jack, meaning a coat of mail, then a short military coat worn over the coat of mail, and thence the familiar jacket (*q.v.*). By extension the word was applied to other articles of military apparel, *e.g.* the jack boot, and comprehensively to a soldier fully equipped, termed a jackman.

Jack. Mechanical device for raising weights through a distance, so called because it supplies the place of an assistant.



The most common type lifts a motor vehicle from the ground. Various principles are employed: ratchet and lever, screw spindle and bevel gearing, and oil hydraulic. Many vehicles have permanent hydraulic jacks fitted to their underframe. Another manual jack is used on railways to raise the track when packing ballast under sunken sleepers. To lift heavier objects there is a hydraulic jack, which is in effect a small hydraulic press.

Jack. A flag which is used at sea as a signal or mark of distinction. Specifically it is the small flag worn on the jack-staff at the bow of a ship by which nationality is indicated. Since the early 17th



Jackal. Specimen of the black-backed African variety

century, except during the Commonwealth, the jack on British ships has been a small Union flag of the period; and since 1707 a small Union flag has been inserted in the upper canton of ensigns worn by the Royal Navy and merchant navy. It is quite incorrect to refer to this flag as the Union Jack when it is not worn as a jack. The origin of the name is obscure, but it is popularly supposed to be derived from Jacobus, the Latin form of James, which was the name of the king of England and Scotland at the time when this flag was introduced into the navy. Every maritime nation has its own jack. In some countries, *e.g.* France and

the Netherlands, it is a small replica of the ensign. The U.S. navy uses a blue flag with a white five-pointed star for each state. Worn at the foremast, the jack is a signal requesting a pilot to come aboard.

and 16 ins. high at the shoulder. The Asiatic jackal is seldom much more than 26 ins. long in the body. The general colour is brown of various hues, but one African species has a kind of saddle of silvery black, while the rest of the body is bright tan. Jackals roam mainly at night and feed upon carrion and small animals, sometimes upon fruit and sugar-cane. They do useful work as scavengers. In India they are said to breed freely with domestic dogs.

Jackass. Male of the domesticated ass or donkey, believed to have originated from the Nubian ass (*Equus africanus*), whose characteristic markings are still evident in the longitudinal stripe along the back and the cross-stripe at the shoulders. Tegetmeier mentions an ass, living in 1893, that had been ridden 55 years earlier. This longevity probably gave rise to the myth that no one ever saw a dead donkey. Laughing Jackass (*q.v.*) is the popular name for an Australian bird (*Dacelo gigas*) of the kingfisher family.

Jack Boot. High riding boot of the 17th century. It reached above the knee, and had a large piece of leather covering the instep. It was superseded by a similar boot, cut away at the top, introduced by the duke of Wellington. A modified jack boot is still worn by fishermen. See Boot.



Jack Boot of 17th century
S. Kins Museum

Jackdaw (*Corvus monedula*). A bird of the crow family, common in Great Britain. Much smaller than the rook, it may be recognized by its greyish neck, white eye, and smaller beak. It is commonly found about castles and church towers, where it builds

its nest in holes in the masonry. It feeds mainly on worms, grubs, and insects. It is easily tamed, but mischievous.

J a c k e t . Upper garment with sleeves and fastening down the front. The word is derived from French *jaque*, coat of mail, later applied to a short



Jackdaw, a bird of the crow family

Jack, RICHARD (b. 1866). British painter. Born at Sunderland, he was educated at York school of art, at South Kensington and in Paris. He first exhibited at the R.A. in 1893. In 1912 his Rehearsal with Nikisch was purchased by the Chantrey trustees. String Quartette appeared in 1914. A member of the Royal Society of Portrait Painters, he became R.A. in 1920. Among his sitters were King George V and Queen Mary.

Jackal (*Canis aureus*). Animal of the dog tribe, common in Africa and S. Asia. Jackals are nearly related to the wolves, but are much smaller and have short, bushy tails. The Egyptian jackal is the largest, being about 50 ins. in total length

military coat or tabard worn over the armour. (*See* Costume.) In engineering the term is applied to clothing, *i.e.* the covering of thin sheet iron or steel over the lagging of a locomotive boiler, cylinder, or other surface protected against radiation of heat; also to the outer casing or pipe enclosing a steam pipe lagged against radiation.

Jacks, LAWRENCE PEARSELL (b. 1860). British theologian. Educated in Nottingham, his birthplace, he graduated at University



L. P. Jacks,
British theologian

College, London. After studying in Germany, he became in 1887 assistant to Stopford Brooke, whose daughter he married, and was afterwards a Unitarian minister. In 1903 he became professor of philosophy at Manchester College, Oxford, and was its principal 1915-31. The first editor of *The Hibbert Journal*, 1902-47, he wrote *All Men Are Ghosts*, 1913; *From the Human End*, 1916; *Life and Letters of Stopford Brooke*, 1917; *The Legends of Smokeover*, and other books about Smokeover (Manchester); *The Inner Sentinel*, 1930; *The Confession of an Octogenarian*, 1942.

His son Maurice Leonard (b. 1894) was educated at Bradfield and Balliol College, Oxford, and was fellow, tutor, and dean of Wadham College, Oxford, 1919-22. Headmaster of Mill Hill, 1922-37, he returned there during 1943-44. From 1938 he directed the Oxford univ. dept. of education.

Jackson. A city of Michigan, U.S.A., the co. seat of Jackson co. It stands on the Grant river, 76 m. W. of Detroit, and is served by rlys. and an airport. The trading and distributing centre of an area producing grain, fruits, and vegetables, it has also rly. repair shops and plants making motor car and aeroplane parts, tires and tubes, refrigerators, machine tools, castings, and furniture. The Republican party was founded at a state convention here on July 6, 1854. Named after President Andrew Jackson, settled in 1829, Jackson was incorporated in 1843, and became a city in 1857. Pop. 49,656.

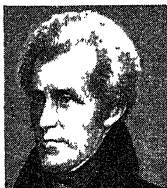
Jackson. City of Mississippi, U.S.A.; state capital and largest city and a co. seat of Hinds co. It stands on the Pearl river, 45 m.

E. of Vicksburg, and is served by the Illinois Central and other rlys. and an airport. Settled in 1820, Jackson was selected as the state capital the following year, and became a city in 1840. During the Civil War it was captured by the Federalists in 1863 and was to some extent destroyed by fire.

Jackson is the seat of several colleges and state institutions. There are new and old capitols, as well as the state historical museum, state library, and municipal art gallery. The oil industry flourishes in the surrounding area, and a natural gas field is being developed. The city processes lumber and cotton-seed oil and makes textiles, fertilisers, fluorescent lamps, bottles, and clothing. Pop. 62,107, two-fifths Negroes.

Jackson. A city of Tennessee, U.S.A., co. seat of Madison co. It stands on the Forked Deer river, 85 m. N.E. of Memphis, and is served by the Illinois Central and other rlys. and an airport. The seat of Union University, it contains also Lane college for coloured students. A large trade is carried on in cotton, maize, and fruit, and industrial plants include rly. workshops, cotton and cotton-seed oil mills, furniture and agricultural implement factories, the nation's largest skewer plant, one of the largest veneer plants, and others producing steel, petrol engines, hardware, varnish, cotton bags, and crates. The city uses power from the Tennessee Valley Authority. Settled in 1820, it became a city in 1845. During the Civil War it changed hands several times, and was a supply depot for Beauregard and headquarters for Grant. Negroes constitute 36 p.c. of the pop. of 24,332.

Jackson, ANDREW (1767-1845). 7th president of U.S.A. Born probably in Lancaster county, S. Carolina, March 15, 1767, of Scottish-Irish descent, he became a barrister. After a brief political life as member of congress, 1796-97, and senator, 1797-98, he engaged



Andrew Jackson,
American president

in business until 1811. In the war against Great Britain he gained a signal victory at New Orleans, Jan. 8, 1815. He crushed the Seminole Indians in 1818, great indignation being aroused in England by his execution of two British subjects on the charge of

secretly encouraging the Seminoles. In 1821 he was made governor of Florida and during 1823-25 was a senator. An unsuccessful candidate for the presidency in 1824, he was elected as a democrat in 1828. In 1832 he was re-elected.

The definite establishment of the "spoils" system, by which existing officials were dismissed wholesale to make way for an incoming president's supporters, is attributed to Jackson, whose term is memorable for the bank war, caused by his veto of the bill for renewing the charter of the Bank of the United States and his instructions that public money deposited in the bank should be removed. This led to his censure by the senate, though the vote was afterwards erased. His threat to enforce the tariff laws at all costs had much to do with inducing the nullifiers to accept a compromise. Generally he opposed the growth of capitalism. After 1836 Jackson retired from public life. He died near Nashville, June 8, 1845. *Consult* Life, J. S. Bassett, new ed. 1916; *The Age of Jackson*, A. M. Schlesinger, 1945.

Jackson, SIR BARRY VINCENT (b. 1879). British theatre manager. Born in Birmingham, September 6, 1879, he founded its repertory company in 1913 producing over twenty plays within four months. After serving in the Royal Navy, he achieved a notable success with Drinkwater's *Abraham Lincoln*.



Sir Barry Jackson,
British theatre manager

In London he put on *Back to Methuselah*; *The Farmer's Wife*, 1924, which ran for three years; *The Immortal Hour*; *Yellow Sands*; *Six Characters in Search of an Author*; *The Apple Cart*; *The Barretts of Wimpole Street*; 1066 and All That, 1935. His published works include *The Theatre and Civic Life*, 1922. During 1929-37 he directed the Malvern summer festivals. A governor of the Old Vic and Sadler's Wells, he was in 1946 appointed director of the Shakespeare Memorial Theatre. He was knighted in 1925. *See* Birmingham Repertory Theatre.

Jackson, FREDERICK GEORGE (1860-1938). A British explorer. Educated at Denstone and Edinburgh university, he travelled in Australia, and in 1893 made a

sledging expedition across the frozen tundra between Ob and Petchora. In 1894 he was given command of the expedition organized by Alfred Harmsworth (later Viscount Northcliffe) to travel to Franz Josef Land and then attempt to reach the North Pole. Meeting Nansen on his retreat from the Fram, Jackson abandoned his polar attempt and spent three years in Franz Josef Land. He saw service in the South African War and the First Great War. In 1925-26 he visited the sources of the Zambesi, Nile, and Congo rivers, descending the whole length of the Congo to the sea. His publications include *The Great Frozen Land*, 1895; *A Thousand Days in the Arctic*, 1899; *The Lure of Unknown Lands*, 1935. He died on March 13, 1938. There is a memorial tablet to him in S. Paul's Cathedral.

Jackson, HENRY (1839-1921). British scholar. Born at Sheffield, he was educated there, at Cheltenham College, and at Trinity College, Cambridge, of which he became fellow in 1864 and tutor in 1866. He was



Henry Jackson,
British scholar
Russell

praelector in ancient philosophy from 1875 until 1906, when he was made regius professor of Greek. During 1914-19 he was vice-master of Trinity. Jackson's writings

are mainly translations of and comments on Aristotle and Plato; he also wrote *About Edwin Drood*, 1911. His attainments were recognized in 1908 when he was given the O.M. He died Sept. 25, 1921.

Jackson, HOLBROOK (1874-1948). British writer. Born at Liverpool, Dec. 21, 1874, he became a journalist. Joint editor of *The New Age*, 1907, he later edited *T.P.'s Weekly*, and *Today*. He was long editorial director of the *National Trade Press*. His first book, *Edward FitzGerald and Omar Khayyam*, appeared in 1899, and his literary studies include *Great English Novelists*, 1908; *The Eighteen Nineties*, 1913; *The Fear of Books*, 1932; *The Printing of Books*, 1938; *Bookman's Holiday*, 1945; *The Reading of Books*, 1946. He died June 17, 1948.

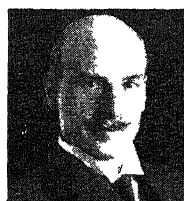
Jackson, SIR JOHN (1851-1919). British engineer. Born at York, Feb. 4, 1851, he studied engineering at Edinburgh university. He obtained his first contract in

1876, and in 1877 successfully completed, in quicksands, the Stobcross docks at Glasgow. The construction at Middlesbrough, Hartlepool, and N. Sunderland docks was followed by that of the commercial harbour at Dover and the extension seawards of the admiralty pier. Other important works were the last eight miles of the Manchester ship canal, the laying of the foundations of Tower Bridge, the deep lock at Barry, and the extension of Admiralty works at Keyham. Jackson constructed the new naval harbour and graving dock at Simon's Town, Cape Colony, a rly. across the Andes, and the great Euphrates barrage near Babylon. He was Unionist M.P. for Devonport, 1910-18, having been knighted in 1895. He died Dec. 14, 1919.

Jackson, JOHN (1769-1845). English pugilist. The son of a London builder, he was born Sept. 28, 1769. Though champion, 1795-1803, he appeared in the ring on only three occasions; when he defeated Fewterel of Birmingham at Smitham Bottom, near Croydon, June 9, 1788; at Ingatestone, Essex, against Ingleson, when he had to retire from the fight owing to a dislocated ankle, March 12, 1789; and his last fight, an easy victory over Mendoza (*q.v.*) at Hornchurch, April 14, 1795. After his retirement "Gentleman Jackson" became famous as a teacher of boxing, opening a school at no. 13, Bond St. and Byron, one of his pupils. celebrated him in verse. He died Oct. 7, 1845. *See* Boxing.

Jackson, PETER (1861-1901). West Indian negro boxer. Born July 3, 1861, in Puerto Rico, he became a seaman. His first fight took place in Sydney, where he eventually won the championship of Australia by beating Tom Lees in 1886. He then went to San Francisco and became boxing instructor at the Californian Club. In 1891 he fought his famous drawn battle of 61 rounds with Corbett. The crowning victory of his career was over Frank Slavin on May 30, 1892, at the National Sporting Club, London. He died in Australia, July 13, 1901.

Jackson, SIR STANLEY (1870-1947). English cricketer and politician. Born Nov. 21, 1870, he was



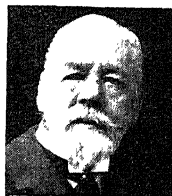
Sir Stanley Jackson,
English cricketer
and politician

Francis Stanley, younger son of W. L. Jackson, of Leeds, who became Lord Allerton. He was educated at Harrow and Trinity College, Cambridge. In 1892-93 he was captain of cricket at Cambridge, and he became a regular member of the Yorkshire team. He played several times for England against Australia, being captain in 1905, and for the Gentlemen. "Jacker" was one of the finest all-rounder cricketers of the time, being almost invariably at the top of his form when the need was greatest. He served in S. Africa, 1900-02, and during the First Great War commanded a battalion of the West Yorkshire Regt. He was M.P. for Howden-shire, 1915-26; chairman of the Unionist party executive, 1923-1926; and, being knighted, was governor of Bengal, 1927-32. In 1934 he was chairman of the M.C.C. selectors for test matches. He died March 9, 1947.

Jackson, SIR THOMAS GRAHAM (1835-1924). A British architect. Born at Hampstead, Dec. 21, 1835, son of a solicitor, he was educated at Brighton College and Wadham College, Oxford. He became a fellow of Wadham, and was trained as an architect under Sir Gilbert Scott. In 1861 he began to practise, and during the next fifty years was responsible for many buildings at Oxford, including additions to Brasenose, Lincoln, Corpus Christi, and Hertford colleges.

His many restorations include Winchester Cathedral, Bath Abbey, Christchurch Priory, and at Oxford the church of S. Mary the Virgin and the Bodleian. Jackson was made A.R.A. in 1892 and R.A. in 1896. In 1913 he was created a baronet. His writings include *Modern Gothic Architecture*, 1873; *Byzantine and Romanesque Architecture*, 1913; *Gothic Architecture in France, England, and Italy*, 1915. He died Nov. 7, 1924.

Jackson, THOMAS JONATHAN (1824-63). An American soldier, known as Stonewall Jackson.



Sir T. G. Jackson,
British architect
Russell



H. Jackson

Descended from an Irish family, he was born at Clarksburg, W. Va., Jan. 21, 1824. He secured a nomination to the military academy at West Point, gained an artillery commission, and served in the Mexican War, 1845-48, winning the rank of brevet-major. Religious convictions induced him to leave the army, but in 1851 he went to Lexington military academy as instructor in science, gunnery, and infantry. Not distinguished as a teacher, he became known for his piety and sympathy with the negroes.

On the outbreak of the Civil War, Jackson joined the Confederates and was quickly promoted brigadier. His brigade by its steadiness at the first battle of Bull Run earned him his nickname of Stonewall. Promoted major-general in Oct., he was transferred to command raw troops in the Shenandoah Valley. His stern discipline soon had effect, and although driven out of the Valley, he left it with an increased reputation and a more efficient force. In 1862 by a rapid march he joined Lee in the seven days' battle for the defence of Richmond and helped in McClellan's defeat. From this time he became Lee's most trusted subordinate. He defeated Banks at Cedar Mountain, and in the second battle of Bull Run. In the Maryland campaign, 12,000 Federals surrendered to him at Harper's Ferry.

After this success Jackson's corps was again united with the main force under Lee. It had a share in the battle of Antietam and was equally to the fore at Fredericksburg. The Confederate success at Chancellorsville was due in great part to Jackson's skill. After the battle, while reconnoitring with a small staff, he was shot by mistake by his own outposts. A wound in the left arm made amputation necessary; pneumonia supervened, and Jackson died May 10, 1863. See American Civil War; Chancellorsville.

Jacksonian Epilepsy. A form of epilepsy first discovered by Hughlings Jackson. It is characterised by convulsions localised to a group of muscles or to a function and by the retaining of consciousness until late in the attack. The

condition is due to irritation of a limited area of the motor part of the brain which results in inhibition of the higher centres. See Epilepsy.

Jacksonville. The largest city and an inland Atlantic seaport of Florida, U.S.A.; also the co. seat of Duval co. One of the South's leading ports and rly. and air traffic centres, it stands on the St. Johns River, which flows into the Atlantic. The city is 14 m. from the mouth, and is served by the Southern and other rlys., coastal and foreign steamship lines, and air routes. An excellent inland harbour, with 8 m. of berthing space and warehouses for citrus fruits, naval stores, etc., has been developed by dredging. This is the last port of call on the Atlantic for many vessels going to S. America and the Far East. Jacksonville exports citrus fruits, lumber, and oyster shells, and imports petroleum products, fertiliser materials, creosote, and oil. Here is the world's largest cigar factory; the city produces a tenth of the cigars consumed in the U.S.A. Other plants make fertilisers, chemicals, glass, and tinned foods.

A city blossoming with hibiscus, oleander, and bougainvillea, Jacksonville has a fine system of municipal parks. It is the seat of the Edward Waters college for Negroes and the Florida Historical Society's library, and has the state's largest public library and a municipal stadium. In 1822 it was laid out and named after Andrew Jackson, Florida's first territorial governor; it was incorporated in 1832. During the Civil War it was occupied four times by Union forces, and almost wholly destroyed on their final withdrawal in 1865; also by fire in 1901. Negroes constitute 36 p.c. of the pop. of 173,065.

Jacksonville. City of Illinois, U.S.A., the co. seat of Morgan co. It stands on the Mauvaiseterre Creek, 34 m. S.W. of Springfield, and is served by rlys. In a district producing maize, wheat, oats, and hay, it makes steel bridges, textiles, shoes, and wheels. It is the seat of Illinois College. Settled in 1818, it became a city in 1867. Pop. 19,844.

Jack Straw's Castle. Name of an ancient inn near the highest part of Hampstead Heath (*q.v.*). Once a resort after the races held on the Heath, it became later a favourite with authors and artists. Dickens and his friends often supped here, and the inn is

mentioned in Thackeray's novel *The Newcomes*. It was renovated in 1898, but the upper part was badly damaged by a German land mine, March 19, 1941. When, in 1381, a party of Wat Tyler's force, to which Jack Straw belonged, destroyed the manor house at Highbury (*q.v.*), the ruins there became known as Jack Straw's Castle.

Jack the Ripper. The popular name given to an uncaptured criminal who murdered and mutilated women in the East End of London, 1887-89. There were eight victims in all, beginning Christmas, 1887, and ending July, 1889, though there is some doubt whether the first and last were Ripper murders. Between Aug. 7 and Nov. 9, 1888, six of the murders took place. Though the police actually found one of the women within a few minutes of her murder, the murderer was never captured. Sir Robert Anderson left it on record that the criminal was probably a sexual maniac, a Polish Jew known to the police. The former belief was borne out by the peculiar way in which most of the women were mutilated.

Jacmel. Seaport of Haiti. It stands on the S. coast, on Jacmel Bay, 30 m. S.S.W. of Port-au-Prince. The roadstead affords good anchorage $\frac{1}{2}$ m. off shore. Principal exports are coffee, logwood, gum, cotton, and cotton seed. The town consists chiefly of wooden houses and narrow streets.

Jacob. Younger son of Isaac and Rebekah (Gen. 25). Having obtained his elder brother Esau's birthright and his father's blessing by stratagem, he became his father's heir and one of the three great patriarchs of the Israelites. He seems to have been the favourite son, and was certainly better fitted than his brother to become the leader of a great tribe. In the vision at Bethel of a ladder set up from earth to heaven, he was assured of divine protection.

Having journeyed to Haran, he served his uncle Laban 14 years as a shepherd and obtained first Leah and then Rachel as his wives; here all his sons were born except Benjamin. During this period he flourished greatly and became wealthy in flocks and herds. Returning to Canaan, he saw a vision of angels at Mahanaim, and wrestled with a mysterious visitor on the bank of the Jabbok, when he received the new name of Israel. At a meeting with his brother Esau immediately afterwards, a complete reconciliation

was effected. Jacob then settled at Shechem.

The sale of his son Joseph to Egypt was a bitter grief, only allayed when a famine caused him to send his other sons to Egypt to buy corn, and the high position of Joseph was discovered. Soon after their return, he removed with his family to Egypt, where he was honourably received by Pharaoh, and settled in Goshen in the delta of the Nile, where the remainder of his life was spent in peace and prosperity. *See* Jews.

Jacob, A. M. (?1850–1921). Oriental adventurer. Perhaps an Armenian or a Pole, but claiming Turkish nationality, he was sold as a slave boy to a pasha. After making the pilgrimage to Mecca, he obtained employment as a scholar at the court of the nizām of Hyderabad. He dealt in jewels at Delhi, then moved to Simla, where he amassed a large fortune. After an unsuccessful deal in diamonds with the nizām, he was accused of fraud, and although acquitted he was ruined. The original of Lurgan Sahib in Kipling's *Kim*, and central figure in F. Marion Crawford's *Mr. Isaacs*, he died in Jan., 1921.

Jacob, NAOMI (b. 1889). British novelist. Born of Jewish stock at Middlesbrough, July 1, 1889, she became an active supporter of the women's suffrage movement, and was on the stage. During the 1920s she made her reputation as a novelist, for long writing two books annually. The best-known include *The Man Who Found Himself*, 1929; *Roots*, 1931; *Four Generations*, 1934; *Fade Out*, 1937; *Susan Crowther*, 1945. She also wrote autobiographical volumes, e.g. *Me*, 1933; *Me and the Mediterranean*, 1945; and a biographical study of Marie Lloyd.

Jacobabad. Town and taluka in the Upper Sind Frontier district of Pakistan, on the Baluchistan border. It was the chief military frontier station before the occupation of Quetta in 1877. Its cantonment was retained until 1914. The town was planned and laid out on the site of the village of Khangarh by Gen. John Jacob, commandant of the frontier, 1847–58, who built the residency. A clock made by Jacob still works. Buried in Jacobabad, he is honoured as the "pacificator of Upper Sind." This is a flourishing market town and the headquarters of the district. Very dry (average rainfall about 2 ins. a year), it has usually the highest temperatures in the Indian peninsula, reaching

about 126° F. in May and June. Pop. of taluka, 65,307; town, 21,588.

Jacobi, ABRAHAM (1830–1919). German-American physician. Born in Westphalia, May 6, 1830, he took a medical degree at Bonn, but having suffered imprisonment for his political views, went to America, where he began to practise in New York, 1853. Specialising in children's diseases, from 1860 to 1870 he was professor of that subject in New York, and thence to 1902 in the college of physicians and surgeons, Columbia university. He set up a children's clinic in 1862, wrote largely on his special subject in Latin, English, and German, and was the founder of pediatrics (science treating of the hygiene and diseases of children) in America. He died July 10, 1919.

Jacobi, CARL GUSTAV JACOB (1804–51). A German mathematician. Born of Jewish parents at Potsdam, Dec. 10, 1804, he was the most inspiring mathematical teacher of the first half of the 19th century and perhaps the greatest Jewish mathematician. He was the professor of mathematics at Königsberg, 1827–42. His most celebrated investigations were on elliptic functions, the modern notation of which is substantially owed to him, and the theory of which he established at the same time as the subject was being investigated by the young Norwegian mathematician Abel.

Among his other investigations were those on determinants, commemorated by the use of the term Jacobian as applied to one important form of determinant. He followed Gauss in developing the theory of numbers. His memoirs on differential equations; his development of the calculus of variations; and his contributions to the problem of three bodies, are all of first-class importance. He died at Berlin, Feb. 18, 1851.

Jacobi, FRIEDRICH HEINRICH (1743–1819). German philosopher. Born at Düsseldorf, Jan. 25, 1743,

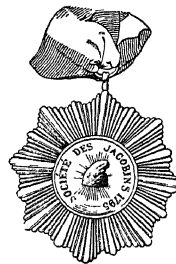


F. H. Jacobi,
German philosopher

and educated for a commercial life, he was early attracted by philosophy and theology. Jacobi was equally opposed to Hume's scepticism, French materialism, and Kant's formalism—in fact to all speculative philosophy. According to him, all knowledge was

founded on faith or immediate intuition, a sort of instinct whereby the mind immediately grasped the most important religious truths. During 1807–12 he was president of the Academy of Sciences, Munich, where he died March 10, 1819.

Jacobins. Political society in France, prominent during the Revolution. The body originated in the



Jacobins. Badge of
the revolutionary
society

meetings of some members of the *States-General* at Versailles, calling themselves the Breton Club. Later they gathered in a Dominican convent in the Rue St. Honoré, Paris; a name for the Dominican order. The Jacobins at first were constitutional monarchists, and styled themselves the Friends of the Constitution, including among their number d'Aiguillon, Mirabeau, de Noailles, Grégoire, Barnave, Chénier, and the Lameth brothers. Numerous affiliated Jacobin clubs sprang up all over the country.

After the king's flight to Varennes, 1791, there was a schism in the club, the *Feuillants* and *Girondins* being offshoots, and this was accentuated by the abolition of royalty and the proclamation of a republic. Henceforth the extreme republicans—Robespierre, St. Just, Marat, and Couthon—dominated the body in the capital and in the provinces. During the Terror their small but compact organization gave them unrivalled power, but the fall of Robespierre brought their sway to an end, and the club was closed in Nov., 1794. Attempts at revival were made in 1796 and after the *coup d'état* of 18 Fructidor, 1797, but in 1799 the Jacobins as such had ceased to exist. They wore a badge showing a Phrygian cap of liberty.

In other countries the name Jacobins became synonymous with holders of advanced political ideas. Similar societies were founded in England, notably the London Corresponding Society and the Friends of the People (*q.v.*), to which the newspaper, *The Anti-Jacobin*, 1797, was a counterblast. *See* *Feuillants*; *French Revolution*; *Girondins*; *Mirabeau*; *Robespierre*.

Jacobite Church. Name given to the followers of Jacob Baradaeus, a Monophysite monk of

Edessa (d. 578), who reorganized and restored the sect. The name was later applied to the Oriental churches of Egypt, Antioch, and Armenia, which were charged with holding the Monophysite (*q.v.*) heresy. A development of the teaching of Eutyches (*q.v.*), it was supported by Dioscorus, patriarch of Alexandria, who was condemned and deposed by the council of Chalcedon (A.D. 451).

But the majority of the Church of Egypt, now known as the Coptic Church, rejected the decisions of the council, and the result was a succession of Monophysite patriarchs of Alexandria. A rival succession of orthodox patriarchs was maintained until about 640, when the Mahomedans took the Monophysites or Jacobites under their protection. The sect became powerful in Palestine and Asia Minor, and finally became established as the national Church of Egypt. At the present time the Jacobite Church includes the three patriarchates of Alexandria, Antioch, and Armenia; but its bishops repudiate Monophysite doctrines and are as orthodox as those of other Oriental Churches.

Jacobites. Supporters of James II of England and his descendants. After his flight from England in 1688, through the rest of his life and that of his son James Edward (*q.v.*), the Old Pretender, the adherents of the exiled Stuarts were known as Jacobites. In Ireland they were powerless; in Scotland they were relatively much more numerous than in England. It was inevitable that the sympathies of Roman Catholics should be Jacobite; so also were those of English Churchmen who upheld the doctrines of divine right and passive obedience. But the real strength of the Jacobites lay in the emotional sentiment of loyalty to the royal house, and in the absence of any corresponding sentiment in favour of Dutch William or of the Hanoverian Georges.

In England, at least, Jacobites generally realized that after Dundee's death at Killiecrankie, July 27, 1689, and William's victory of the Boyne, July 1, 1690, there was no prospect of a successful Stuart restoration without substantial aid from France. Politicians, seeking to be secure in any event, corresponded with the Stuart court. Several Jacobite plots against King William were detected and suppressed. In 1714 the plans of Bolingbroke for effecting a Stuart restoration were foiled by the sudden death of Queen Anne. After the

accession of George I (1714) the wretchedly organized rising of 1715-16, the "Fifteen," proved a melancholy fiasco. A still more futile attempt collapsed in 1719.

No other organized effort was made till the landing of Charles Edward, "Bonnie Prince Charlie," the Young Chevalier or Pretender, in Moidart in 1745. For a moment it almost seemed that the Jacobite cause might be successful, but it was finally shattered at the battle of Culloden, April 16, 1746. Any remaining hopes were destroyed by the moral collapse which overtook Charles Edward; while the destruction of the clan system in the highlands of Scotland deprived the Jacobites of the only military base they had possessed. Thenceforth Jacobitism became nothing more than a pious sentiment, romantically cherished, but without any real desire of fulfilment. See Charles Edward; James Edward; Culloden; Fifteen, The; Forty-Five, The; King over the Water, The; Sheriffmuir; Stewart; consult also The Jacobite Relics of Scotland, J. Hogg, 1819-21; The Fallen Stuarts, F. W. Head, 1901.

Jacobs, HELEN HULL (b. 1908). U.S. lawn tennis player, born at Globe, Arizona, Aug. 6, 1908.

She won the women's singles and doubles titles of California in 1926, and played for her country in the Wightman Cup every year from 1927 to 1937 and in 1939. From 1932 to 1935 she was U.S. lady champion, and at Wimbledon was runner-up in the singles on five occasions and winner in 1936. Her favourite stroke was a heavily chopped drive.

Jacobs, WILLIAM WYMARK (1863-1943). British author. The son of a wharf manager, he was



Helen Jacobs,
U.S. lawn tennis
player



W. W. Jacobs

Russell

born at Wapping, London, Sept. 8, 1863, and was privately educated. In 1883 he entered the civil service, and until 1899 was a clerk in the Post Office Savings Bank. By this time he had made a success with some short

stories and a humorous novel, The Skipper's Wooing, 1897, and henceforward gave his whole attention to writing. He died Sept. 1, 1943.

His volumes of short stories include Many Cargoes, 1896; Sea Urchins, 1898; Light Freights, 1901; The Lady of the Barge, 1902; Odd Craft, 1903; Captains All, 1905; Short Cruises, 1907; Sailors' Knots, 1909; Ship's Company, 1911; Night Watches, 1914; Deep Waters, 1919; Sea Whispers, 1926. Longer stories, besides The Skipper's Wooing, are A Master of Craft, 1900; At Sunwich Port, 1902; and Dialstone Lane, 1904. Jacob's stories are mainly of seafaring men, whose innocence or ignorance lands them into foolish and improbable adventures. Many are told by his best-known character, the Night Watchman. A certain monotony in plot, treatment, and character may be urged, but they are full of the humour of understatement, and in his peculiar field their author is without a rival. He excels in short stories of the occult, *e.g.* The Monkey's Paw, one of the most powerful of its kind, dramatised by L. N. Parker, 1910. He was also part author of a play, Beauty and the Barge.

Jacobsen, JENS PETER (1847-85). A Danish author. Born in

Jutland, April 7, 1847, he was from childhood interested in both science and letters. He first studied botany in Copenhagen, and was awarded the gold medal of the Academy for his contributions to Danish botanical knowledge in 1872. He translated Darwin's Origin of Species and Descent of Man. In 1872 he published his first book of stories. Mogens. He then began an historical novel, Marie Grubbe, 1873-76, but put it aside for some years while he travelled in Germany and Italy. An artist in prose, he died of tuberculosis at Thisted, April 30, 1885. Of his works, Niels Lyhne, 1880, has been translated, as Siren Voices, into English; so have Marie Grubbe, and Jacobsen's poems. His collected works were published 1888 and 1918.

Jacob's Ladder, GREEK VALERIAN, OR CHARITY (*Polemonium coeruleum*). A perennial herb of the family Polemoniaceae. A native of Europe, N. Asia, and N.

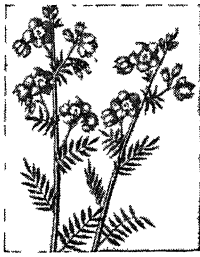


J. P. Jacobsen,
Danish author

America, it has a short, creeping rootstock and tall leafy stems. The long leaves are broken up, feather-wise, into from six to twelve pairs of smooth, lance-shaped leaflets. The stem and branches end in a large cluster of fine blue or white drooping flowers.

Jacobus (Lat. form of James). Name of a gold coin struck by James I of England. Its value was 25s. See Coinage.

Jacoby, HENRY (d. 1922). A British murderer. On March 14, 1922, Lady White, a sixty-year-old widow, was found unconscious in bed at an hotel in Marylebone suffering from terrible head wounds; she died the following morning without regaining consciousness. On March 21 Jacoby,



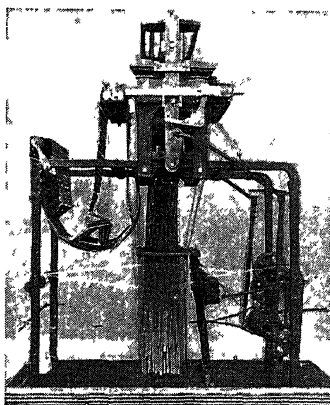
Jacob's Ladder. Stalks with flowers and foliage

invented his loom, which was exhibited in Paris in 1801. Improvements and modifications of the original loom revolutionised the weaving industry, and in 1806 the invention was acquired for the nation, Jacquard being granted a royalty and a pension. He died Aug. 7, 1834. See Lace.



J. M. Jacquard, French inventor After Bonnefond

Jacquard Loom. A pattern-weaving loom invented by Joseph M. Jacquard (v.s.). It enabled individual warp threads or groups of threads to be lifted in a pre-arranged order automatically, in conformity with the set design. Before Jacquard's invention only simple designs could be woven, by connecting groups of warp threads to one or more heddles, the latter operated by depressing corresponding pedals. More complex designs needed three persons to operate the loom: one who "read" the master design and called out to a second which threads to lift; and directed the third (the weaver) what colours he must next employ in shooting his shuttles.



Jacquard Loom. Early model of the loom invented by J. M. Jacquard

Vaucanson had invented a mechanism which allowed simple or small designs to be woven automatically. Vaucanson used a horizontal cylinder perforated with holes in regular lines as the controlling energy; to every warp thread was attached one end of a vertical lifting thread, and the opposite ends of the latter were led to a framework in which were needles pressed by springs against the face of the cylinder. Around the cylinder was wrapped a card perforated with holes to coincide with the master design, in such a way that a hole would allow the corresponding needle to pass and enter a hole in the cylinder beneath: this caused the lifting thread in question to lift its warp thread; all other lifters were unaffected unless operated by perforations in a similar manner. The drawback to Vaucanson's arrangement was that the entire design had to be contained on the card wrapped about the cylinder, the diameter of which was limited by mechanical considerations.

Jacquard, while retaining Vaucanson's cylinder and a modification of the same inventor's thread-lifting device, introduced a series of rectangular cards, each linked by a hinge to the next, as the operating mechanism in place of the card which Vaucanson had wrapped around the cylinder. Thus a comparatively small design could be worked by connecting the required cards into an endless band which passed regularly through the overhead "box"; or a much longer series of cards might be used, folded over and stacked as they descended automatically from the box above. When the weaver depressed a pedal, the "griffe" overhead engaged with and lifted the hooks attached to the lifting threads, provided that plungers linked with these threads passed through perforations in the cards; otherwise, the hooks were out of engagement, and the griffe slipped past them without raising them. Jacquard's loom revolutionised figure weaving and in its developments is important today. He was a pioneer in utilising punched cards to control mechanical movements. See Loom; Weaving.

Jacquemart, JULES FERDINAND (1837-80). French engraver and painter. Born in Paris, Sept. 3, 1837, he studied art under his father, Albert Jacquemart (1808-75), his son's first considerable work being a series of etchings for the *Gazette des Beaux-Arts*, 1859. In

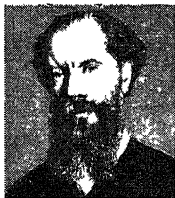


Jacobus. Obverse and reverse of the gold coin struck by James I

an 18-year-old pantry boy, was charged with the crime. Jacoby admitted to detectives that he had decided to rob the guests' bedrooms, and made his way to the basement where workmen had left their tools. He took a hammer; entered Lady White's room; and struck her with the tool when the light of his torch awoke her. Terrified, the boy washed the hammer and returned it; but its unnaturally clean condition had attracted the attention of the police and caused them to cross-question the hotel staff. Tried at the Central Criminal Court on April 28, Jacoby was found guilty. His youthful appearance aroused public sympathy, and seldom has a death sentence evoked such criticism. Two petitions recommending him to mercy were presented to the home secretary, but Jacoby was hanged at Pentonville on June 7.

Jacopone da Todì (c. 1240-1306). An Italian poet. Of noble family, he became a Franciscan. His ecstatic devotion inspired many remarkable examples of impassioned mysticism, and his religious dialogues or *laudes* displayed considerable satiric power. He was imprisoned for opposition to Pope Boniface VIII, 1298-1303, and

1862 he supplied the plates for his father's *Histoire de la Porcelaine*, and in 1864 produced 60 plates for Barbet de Jouy's *Les Gemmes et Joyaux de la Couronne*. One may cite also 12 plates for his father's *Histoire de la Céramique* and for the *Histoire du Mobilier*, and about 400 reproductive etchings. One of the founders of the *Société des Aquarellistes*, he died Sept. 26 1880.



J. E. Jacquemart,
French engraver

Jacquemart-André Museum. Museum of fine arts in the Boulevard Haussmann, Paris. It contains pictures, sculptures, and *objets d'art*, bequeathed to the Institute of France by Nélie Jacquemart (1840-1912), a painter who married the banker and collector, Edouard André. Opened Dec. 8, 1913, the collection contains works by Fragonard, Nattier, Lancret, and others of the French school; Reynolds, Gainsborough, and Hoppner of the English; Rembrandt, Hals, and Ruysdael of the Dutch; Memling and Rubens of the Flemish; and many Italian masters, notably the S. George and the Dragon of Paolo Uccello, a head of Christ by Mantegna, and a Virgin and Child by Baldovinetti. There are also several fine tapestries, illuminated MSS., and Louis XV and XVI furniture.

Jacquerie. Name given to a rising in France. In May, 1358, while the country was being ravaged by the English invaders, the peasants around Beauvais, in Normandy, rose in rebellion. The movement spread, the nobles retaliated, and as one chronicler says, "cultivation ceased, commerce ceased, serenity was at an end." The citizens of Paris sent a force to help the peasants, but the nobles also found assistance, and their armed disciplined forces soon got the upper hand. In six weeks the rising was quenched in blood: 20,000 peasants are said to have been slain between the Seine and the Marne. The leader of the rebels, William Collet from Clermont, was tortured and hanged. The name *Jacquerie* means the rising of Jacques, Jacques Bonhomme being a popular name for the French peasant. *See France; History.*

Jactitation (Lat. *jactitare*, to boast). Ecclesiastical law term. It means making a false pretension or boast of a marriage. If a person

falsely pretends to be married to another, the latter may bring a suit for jactitation of marriage; and on the case being proved, the respondent is ordered to be silent for the future. *See Divorce; Husband and Wife.*

Jade. Several compact greenish minerals capable of taking polish have been confused under the term jade, which should be restricted to two minerals, nephrite and jadeite. These are extraordinarily alike in appearance, but differ in specific gravity determination: nephrite, 3.0-3.1; jadeite, 3.3. The name jade comes from Span. *ijada*, flank or side, because the stone was considered a cure for the colic if worn on the side. Similarly, nephrite is from Gr. *nephros*, kidney. Jade is highly prized as an ornamental stone, which has been worked by craftsmen since ancient times, especially in Egypt, China, and other Eastern countries. *See Jadeite; Nephrite.*

Jade or JAHE. River and bay of Oldenburg, Land of Lower Saxony, Germany. The river falls into the bay after a course of only 13 m. The bay is an opening of the North Sea, near the mouth of the Weser. Formed by the sea breaking on the land, it covers 75 sq. m., and affords safe anchorage. Wilhelmshaven (*q.v.*) stands at its entrance. *Pron.* Yah-de.

Jadeite. One of the monoclinic pyroxene group of rock-forming minerals. Colour is variable, generally with green tints. This is essentially a metasilicate of sodium and aluminium; the origin is controversial, but it may be caused by the deep-seated metamorphism of rocks like nepheline-syenites or phonolites. Compact, finely granular, jadeite is the more valuable of the two minerals included under the term jade (*see Nephrite*). The jadeite carved in China was imported from Upper Burma.

Jaeger (Ger. hunter). Type of German infantry unit, or soldier in such unit. Corresponding roughly to the British rifle regiments and the French *chasseurs* (*q.v.*), jaeger regiments were organized as normal infantry except that their transport was entirely on a pack basis, and the battalion sometimes included a company of guns. They were specially trained in skiing and mountain warfare. Some regiments were described as Gebirgs-jaeger, mountain troops. In the Second Great War Panzerjaeger were anti-tank units. There was a Panzerjaeger regiment to every division; each infantry battalion contained a Panzerjaeger company.

Jaeger, HANS (1854-1910). A Norwegian author. Born Sept. 2, 1854, at Drammen, he became a sailor, then a clerk in the Norwegian parliament. He created a sensation by publishing in 1885 the daring naturalistic novel *Christiania Bohème*, a plea for unmarried love; confiscated, this book provoked widespread intellectual conflict. The author fled and, mostly from Paris, published other novels: *Sick Love*, 3 vols., 1893; *Prison and Despair*, 1902. In 1907 he exposed further ideas in an Anarchist Bible. His books were later translated and appeared far less radical than to the contemporaries of Jaeger, who died at Christiania (Oslo), Feb. 8, 1910.

Jael. Wife of Heber the Kenite (Judges 4 and 5). After the defeat of Jabin's army by the Israelites under Barak and Deborah, Jabin's general Sisera fled to Jael's tent for refuge. Jael, choosing between violation of the laws of hospitality and betrayal of Israel, killed the fugitive in a manner described differently in the prose of chap. 4 and in Deborah's song (the earlier version) in chap. 5.

Jaén. Inland prov. of S. Spain, in Andalusia. It is bounded N. by the Sierra Morena, E. by Murcia, W. by Córdoba, and S. by Granada. Its area is 5,209 sq. m. Mostly mountainous, it lies within the basin of the upper Guadalquivir, and its valleys are fertile, producing cereals, oil, and wine, though the bleak uplands pasture only sheep. Its mineral wealth, known to the Romans, is great; there are 400 lead mines, including the historic silver lead mine at Linares; iron, copper, and salt are also worked. In the W. communications are good, but the E. half has no rly. Jaén was a petty Moorish kingdom until 1246, after which it came under the sway of Castile. Pop. est. 800,566.

Jaén. City of Spain, the capital of Jaén prov. On the N. slope of the Jabalcuz Mt., at an alt. of 1,500 ft., overlooking the Jaén river, it is on the Linares-Puente Genil rly. There are remains of a Moorish castle and walls, and a Renaissance cathedral, containing one of S. Veronica's miraculous handkerchiefs. The manufactures include textiles, leather, soap, and alcohol. The sulphur baths and springs of Jabalcuz are well known. As the Moorish Jayyan, this was a wealthy city, celebrated for its silk, and the capital of a small kingdom, until its conquest in 1246 by Ferdinand III of Castile. Pop. est. 65,039.

Jafarabad. Town of Saurashtra, India, in the Kathiawar pen. It stands on the Gulf of Cambay, 38 m. E.N.E. of Du Head, about 1 m. from the sea. It was the capital of a petty state (area 53 sq. m.; pop. 14,000) of the same name, merged in 1943 in Saurashtra. Pop. 7,500.

Jaffa, or Yafa. A seaport of Palestine, the ancient Joppa. About 50 m. N.W. of Jerusalem, it lies immediately S. of Tel Aviv, with which it forms a continuous built-up area and, since Oct. 4, 1949, one admin. unit. A broad gauge rly. connects it with the main line at Lydda. There is only a small craft harbour, but larger vessels anchor at open roadstead. Jaffa is the centre of Palestine's citrus fruit industry, and has given its name to an orange. Oil and wool are other exports. Before 1948 it was mainly an Arab city, but after the formation of the state of Israel the Arab pop. (over 60,000) fled.

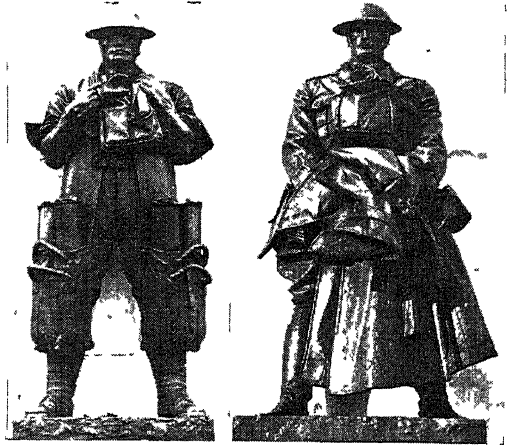
The name of Jaffa appears in history as early as the 15th century

B.C., and is mentioned as Joppa in the Bible. During the 12th century A.D. it was twice taken and lost by the Crusaders. Napoleon captured it in 1799. In the First Great War Jaffa was captured from the Turks by Allenby's forces, Nov. 17, 1917, as a preliminary move designed to secure the British left flank in the coming operation against Jerusalem. No resistance was offered to Australian and New Zealand troops who occupied the town.

Jaffna. Town of Ceylon. The flat portion of N. Ceylon, known as the Jaffna peninsula, is broken up by two shallow lagoons of brackish water and connected at a few points with the sea; one of these really makes the peninsula an island. During the monsoons new sandbanks are constantly made in the shallow channels. The town is the centre of an area peopled by Tamils, and was formerly the port for Tamil immigrants from Madras province. It has a shallow harbour and is connected by rly. with Colombo. Pop. 63,000.

Jagannath. In Hindu mythology, a form of Vishnu, familiarly known as Juggernaut (*q.v.*).

Jagellon. Name of the family that ruled Poland from 1386 to 1572. In 1386 the hand of the heiress to the Polish throne, then a child, was given to Jagiello, grand duke of Lithuania. He took the



C. S. Jagger. Two of the great bronze figures on the Royal Artillery memorial, Hyde Park Corner, one of this sculptor's finest works. See entry below

name of Ladislaus when he was crowned king of Poland in 1386, but his descendants were known by his original name corrupted into Jagellon. The last of the Jagellon kings was Sigismund, who died in 1572. See Poland: History.

Jagersfontein (Dutch, hunter's spring). Town of the Orange Free State, S. Africa. It is 9 m. E. of Fauresmith, and is connected by rail with Springfontein. Here an important diamond mine was discovered in 1878.

Jagger, CHARLES SARGEANT (1885-1934). British sculptor. Son of a Yorkshire colliery manager, he studied art at Sheffield and the Royal College of Art. A fine technician, he executed the British War Memorial to Belgium in Brussels and the Royal Artillery memorial at Hyde Park Corner. For his fine group in stone at Imperial Chemical House, Westminster, Jagger was awarded a medal by the R.S.B.S. in 1933. He is represented at New Delhi by a statue of George V. Jagger, who took the Rome prize in sculpture in 1924, died in London, Nov. 16, 1934.



C. S. Jagger, British sculptor



Jaffa, Palestine. Air view of the harbour and ancient town. Top left, main business street, connecting Jaffa with Tel Aviv

Jaggery. Sugar made of sap drawn from the upper stems of various palms, chiefly *Phoenix silvestris*. It is a common name for sugar in the East. As much as 15 p.c. of sugar is contained in the juices of some palms, and if fermented and distilled a form of ar-rack results. See Date Palm; Sugar.

Jaguar (*Felis onca*). The largest species of the American spotted cats, inhabiting the forests of Central and S. America, and the pampas of Argentina. A savage beast, it is heavily built, the head and body measuring 4 ft., independently of the tail; the head is ponderous, and the short limbs and feet are massive and powerful.

Though the scheme of coloration may be said to be similar to that of the leopard, the black spots are larger and squarer, and arranged in more definite rows, instead of rosettes. As the beast is arboreal in its habits, resting during the day upon limbs of trees, this type of colouring reproduces the shadows thrown by leaves, and enables the jaguar to approach its prey unseen. It is very destructive to monkeys, mounting up to the topmost branches in their pursuit; or it will drop from a limb upon a peccary passing beneath.

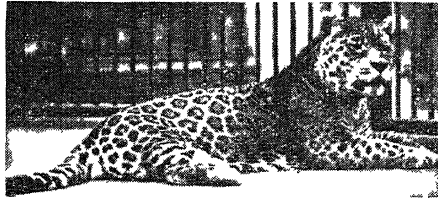
The jaguar is frequent in the forests that border the great rivers, where it kills alligators and turtles, not hesitating to pursue them into midstream. The eggs of the turtle are dug up and consumed by it. It ventures far out on the pampas, where it destroys cattle, horses, and sheep.

Jaguarondi (*Felis jaguarondi*). A species of wild cat, found in Central and S. America. It varies in colour from almost black to a reddish grey, and is without markings. Its average length is 4½ ft., nearly half of which is tail. The eye, unlike that of many cats, has a round pupil. The creature preys on birds and small mammals.

Jahn, Otto (1813-69). German archaeologist and philologist. Born at Kiel, June 16, 1813, he travelled in France and Italy; and held chairs in archaeology at Greifswald, Leipzig, and from 1867 at Berlin. He wrote on the paintings of Polygnotus, 1841; on Hellenic art, 1846; and on Greek vase-paintings, and edited several Greek and Latin classics. His biography of Mozart, 1856-60 (Eng. trans. 1891), is an important contribution to musical history. He died at Gottingen, Sept. 9, 1869.

Jahu. Town and district in the state of São Paulo, Brazil. The town is about 150 m. N.W. of the capital and is served by rly. Breweries and distilleries give employment, and the district is agricultural, supporting a pop. of about 80,000.

Jahvist or **YAHWIST**. In Biblical criticism, the name given to the author of the passages in the Hexateuch, in which the word



Jaguar, S. American member of the cat tribe
Gambel, Bolton, F Z S

Yahweh or Jehovah is constantly used as the name of the Almighty. See Bible; Criticism: Biblical; Hexateuch; Jehovah.

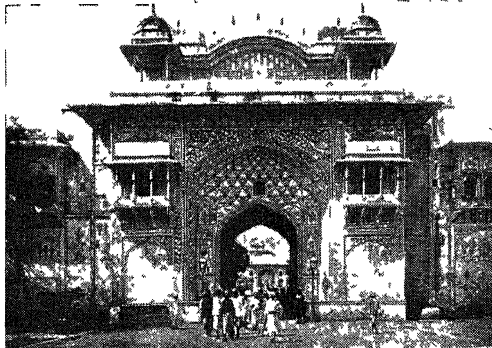
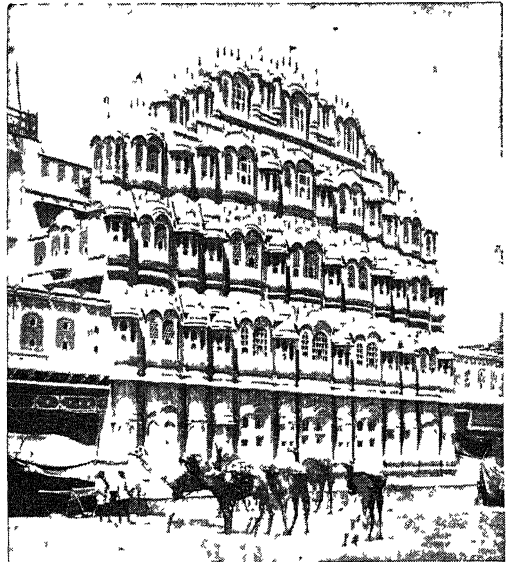
Jainism. A form of Hindu religion long practised in N.W. districts of the Indian subcontinent. Jainism is said to date from the 6th century B.C. and it was apparently a development of Brahmanism akin to Buddhism. It rejected the divine authority of the Brahman sacred writings, and evolved a kind of pantheon of saints, known as Jina or Jains. Its followers believe in a future existence for all forms of life, and take extraordinary precautions to avoid accidentally killing even the smallest creature. Peaceful, gentle, and liberal, they practise abstinence and other forms of penance, many of them going without clothing, and even starving themselves to death. They reject the caste system of the Brahmans, but most of them belong to the wealthier classes. Their numerous temples are noted

for superb architecture; but the sect now numbers only about a million. See Calcutta illus.; Hinduism; India.

Jaintia Hills. A mountainous district of Assam, which lies E. of the Khasi Hills and S. of the Brahmaputra, and is inhabited by a race called Panars, who speak a monosyllabic language.

The district produces rice in abundance; coal and limestone are the chief minerals. The town of Jaintiapur lies at the S. base of the hills.

Jaipur. A state of India, since 1949 part of Rajasthan union. It lies between the Punjab, Bikaner and Ajmer-Merwara; the middle is a tableland, and to the N. and W. lies the continuation of the Aravalli Hills in a series of low heights. The Banas is the chief river. The principal crops are millet and barley. Cotton and woollen goods are manufactured. Salt and cotton



Jaipur, India. One of the seven city gates. Upper picture, the Hawa Mahal or Hall of the Winds

are exported; the imports include piece goods and rice. The ruler, a maharaja, became in 1947 rajpramukh of Rajasthan. Jaipur (area 15,610 sq. m.) acceded to the dominion of India, Aug., 1947. Pop. 3,040,876.

Jaipur. Capital of Rajasthan, India. Minor industries are

carried on. There are several important buildings, notably the maharaja's palace (Jaipur was cap. of Jaipur state). Jaipur is a rly. junction, with lines to Delhi, Jodhpur, Baroda, and Bombay. It is one of the chief places in Rajputana, and was founded in 1728. Here in 1949 the union of Greater Rajasthan was inaugurated. Pop. 175,810, two-thirds Hindus, one-quarter Mahomedans.

Jaisalmir OR **JESSULMIR**. Former state of India, since 1949 part of the Rajasthan union. In the W. of Rajputana, the soil is mostly barren, and the few patches of cultivable land support a sparse population. Jaisalmir, the capital, about 140 m. W. by N. of Jodhpur, is noted for its Jain temples. The ruler, a maharawal was entitled to a salute of 15 guns. Area, 16,062 sq. m. Pop. state 93,246; city, 7,900.

Jakarta. Indonesian name of Batavia (*q.v.*), former capital of the Netherlands E. Indies.

Jakobshavn. A Danish settlement on the W. coast of Greenland. It stands on the shore of Disco Bay amid bleak and barren surroundings. In the vicinity is the immense Jakobshavn glacier, which discharges into the bay.

Jakova OR **DJAKOVA**. Town in Yugoslavia. Lying about 15 m. South of Ipek, it is close to the Albanian frontier. Carpets are made, but the civic arrangements are primitive. Jakova was captured by the Serbs in the Balkan Wars and ceded by the treaty of Bukarest, 1913, to the new state of Montenegro. In the First Great War the Bulgarians held it from Dec., 1915, to Oct., 1918. Pop. 12,000, including many Albanian Muslims.

Jakun. Primitive people in the S. of the Malay peninsula. They are called Orang-bukit, hill-men, or Orang-laut, sea-men. Round-headed, straight-haired, coppery, they show Malay, Semang, or Sakai admixture; their culture and social organization approximate to the unadvanced Malay type. Wielding the blowgun and the spear, the land Jakun occupy pile-dwellings and grow some rice; the sea people use dug-outs.

Jalalabad OR **JELLALABAD**. Town of Afghanistan. It stands on the Kabul river, 80 m. E. of the city of Kabul, in the midst of a fertile plain, near the Khyber Pass into Pakistan. It was founded by Akbar in 1560. Here in 1841-42 the British, under Sir Robert Sale, kept the Afghans at bay for five months. Pop. 14,756.

Jalalpur. Town in Gujarat district, West Punjab, Pakistan. It is a local commercial centre; pop. 17,000. The name is also that of a ruined city in the West Punjab, now a small village.

Jalap (*Ipomoea purga*). Tuberous evergreen climbing herb of the family Convolvulaceae, native of



Jalap. Foliage and flower

Mexico. The roundish tuber, sometimes as large as an orange, contains a resinous principle with highly purgative properties. The smooth, alternate leaves are long, heart-shaped, and the salver-shaped

flowers are a purplish rose colour. Several other species of *Ipomoea* furnish jalap, though of an inferior quality. It is used in dropsy. The name comes from Jalapa.

Jalapa. Department of Guatemala. It is bounded N. by the Rio Grande and watered by its tributaries. The extensive forests yield valuable timber, and the products include sugar-cane, rice, coffee, maize, and tobacco. Area, 1,150 sq. m. Pop. est. 75,000. The capital, Jalapa, the centre of a local trade, is situated 30 m. E. of the ruined city of Guatemala, with which it is connected by rly.

Jalapa OR **HALAPA**. City of Mexico, capital of the state of Vera Cruz. It stands on a slope of the Cofre de Perote, at an alt. of 4,500 ft., 59 m. by rly. N.W. of Vera Cruz, and is a favourite summer resort. Its elegant cathedral contains paintings by Spanish masters; other buildings include a 16th century convent, schools, and hospitals. The city gives its name to the drug jalap, which is common in the district. There are cotton and cigar factories. Pop. 38,620.

Jalaun. District, subdivision, and town in Allahabad division, Uttar union, India. Its area is 1,549 sq. m., about half under cultivation of gram, millet, and wheat. Among the exports are gram and oilseeds. Jalaun town has some small industries. Pop. district, 482,384; subdivision, 203,685; town, 14,271.

Jalisco. Maritime state of S.W. Mexico. It borders on the Pacific Ocean, and is watered by the Rio Grande de Santiago. Area, 31,149 sq. m. In the W. it rises by terraced plateaux to the Sierra Madre with volcanic cones. To the E. and

along the river valleys the soil is fertile, producing tobacco, cotton, indigo, sugar, rubber, palm-oil, etc. Precious stones are found, and gold, silver, copper, and cinnabar are mined. Stock raising is an important industry of this state, one of the wealthiest of Mexico. Its capital is Guadalajara (*q.v.*). Pop. 1,418,310, largely Indians and half-breeds.

Jalna. Subdivision and town, Aurangabad district, Hyderabad state, India. Its area is 744 sq. m. Pop. subdivision, 190,000; town, 38,000.

Jalomitza OR **YALOMITZA**. A river of Rumania. Rising in the Transylvanian Alps, it flows S. through the oil district, and then E. through the Wallachian plain, joining the Danube opposite Harsova. Its length is 150 m. During the First Great War the crossings of the lower part of the river were fiercely contested, Mackensen's army forcing it at Urziceni, Dec. 12, 1916.

Jalón. River of Spain, in the prov. of Saragossa. Rising in the Sierra de la Virgen and the Sierra de Vico, its headstreams unite near Riola, and flow N.E. to join the Ebro, 13 m. above Saragossa, after a course of about 120 m. Alagon, near its junction with the Ebro, is the principal town on its banks. Its valley is followed by the rly. from Saragossa to Madrid.

Jalpaiguri OR **JULPIGURI**. Town of West Bengal, India, capital of the dist. of the same name. It is situated about 52 m. S.E. of Darjeeling, on the Tista river, and on the direct rly. to Calcutta, and carries on a trade in tea, tobacco, timber, and jute. Rice and tea are the chief crops of the dist. The area of dist. is 3,050 sq. m. Pop., dist., 1,089,513; town, 14,000.

Jaluit. Island of the Pacific Ocean. The chief island and the administrative centre of the Marshall Is. (*q.v.*), it lies in lat. 3° N. and long. 170° E. There are plantations of coconut palms, and copra is exported.

Jam. Indian title. Of Tartar origin, the word is a variant of cham, which is connected with khan. It means a chief and was borne by the rulers of Las Bela, a Baluchistan state, and of Nawanagar. See Khan.

Jam. Food consisting of fruit boiled with sugar to the consistency of a paste. It owes its keeping qualities chiefly to the high proportion of sugar, including natural fruit sugars, which it contains. In making jam at home, about 1 lb. of fruit is used to each lb. of sugar,

these amounts producing about 1½ lb. of jam. During the boiling, the fruit breaks up, the sugar dissolves in the juices (a little water is sometimes added to assist this process), and evaporation takes place until the correct concentration is reached. At the same time, the acid in the fruit acts on the cane sugar used, and partly converts it into a mixture of sugars known as invert sugar. This is a necessary part of the process, since jams containing too much unchanged cane sugar will quickly go "sugary." Another effect of the boiling process is to produce

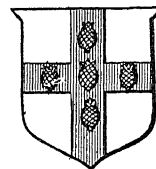
with steam-jacketed pans. The fruit is weighed out into batches of suitable size, and boiled down either with dry white sugar or with sugar which has been dissolved in water to a clear syrup. The pans shown in the illus. are a quick-boiling type designed for use with this syrup. The batches of jam are 80 to 150 lb., and they are boiled from 2 to 12 minutes according to the kind of jam being made and the type of pan used. During this time the water evaporates until a concentration of about 70 p.c. soluble solids is reached. The completion of boiling

jam, the preservative being boiled off in the process. Jam made from pulped fruit is quite wholesome if made from sound materials.

The composition of commercial jams has been controlled by the ministry of Food since Sept., 1940, when an order, subsequently amended but remaining substantially unchanged, came into force based on the standards which had for some time been adopted by the food manufacturers' federation. The minimum permissible soluble solids content is 68½ p.c. No fruit other than that specified may be added, though the addition of small quantities of pectin or fruit juice to assist in setting is permitted. The minimum fruit content is also specified in detail for the various kinds of jam. Jams labelled "fresh fruit standard" must be made entirely from fresh fruit, must be free from artificial colour or preservative, and must have a specified fruit content, varying from 20 p.c. for blackcurrant to 40 p.c. for apricot and plum. "Full fruit standard" jams have the same fruit content, but may be made from pulped fruit.

Marmalade is a jam made from the pulp and shredded peel of oranges, the pips and tough internal skins being removed. Bitter Seville oranges are usually used for the best marmalades, but lemon or grapefruit may be added. Fruit jellies, such as bramble, red-currant, or blackcurrant, are made by boiling the clear filtered juice of the fruit with sugar until it reaches setting concentration.

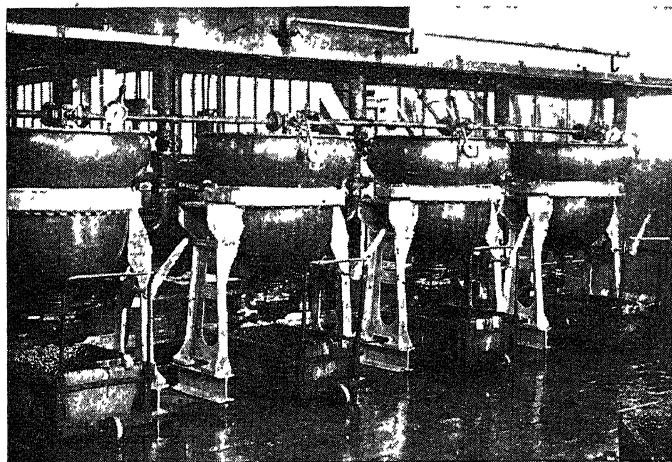
Jamaica. Island of the West Indies. One of the Greater Antilles, it is the largest and most important island belonging to Great Britain in the Caribbean Sea. Occupying a central position in the Antillean region, it is about equidistant from the S. extremity of



Jamaica arms

Florida and the N. coast of S. America, and 90 m. S. of Cuba. Its maximum length is 144 m., breadth about 50 m., and area 4,404 sq. m.

The dependent islands are Grand Cayman, Little Cayman, and Cayman Brac; and the Turks or Caicos islands, which, although geographically included with the Bahamas, are under the govt. of Jamaica. About 30 small cays, eight inhabited, are attached to the group. The largest is Caicos Island, 20 m. in length and 6 m.



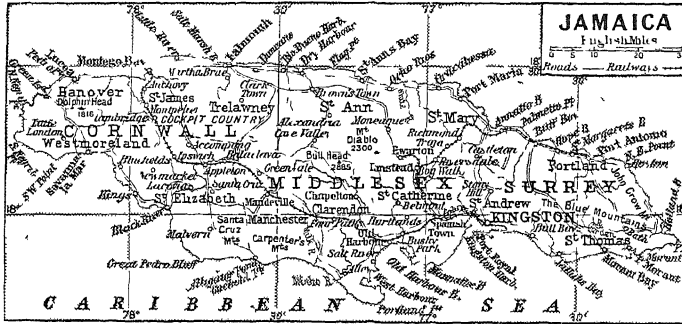
Jam. Rapid-boiling pans used in the commercial production of jam
Courtesy of Crosse & Blackwell, Ltd.

pectin from the fruit tissues. This is a substance which, in the presence of fruit acids and of the necessary amount of sugar, makes the jam set. When fruits are deficient in pectin (e.g. strawberries or raspberries) it is quite justifiable to add a small quantity of pectin derived from another fruit, either in the form of fruit juice or of commercial pectin.

Commercial jams in Great Britain are usually sold in open packs, i.e. in jars with only light paper or parchment covers. They must, therefore, have a sufficiently firm set to stand up to rough handling in transport, and a sufficiently high sugar concentration to resist mould growth even under unfavourable conditions of storage. For these reasons, careful control of the manufacturing process is necessary. The best jams are made during the actual fruit seasons. The freshly picked fruit is brought into the factory as quickly as possible, where it is sorted and the stalks and leaves removed. It then goes at once to the boiling rooms, which are fitted

is indicated by dial thermometers placed in the boiling pans (see illus.). Samples are also drawn at intervals during the day and examined in the factory laboratory, as a final check on the concentration of the jam, and to ascertain that the correct amount of invert sugar has been formed to ensure that no "sugariness" will develop on keeping. The jam is then run off and put into pots either by hand or machine. Owing to the very short boiling time, the fruit does not darken to the same extent as in a home-made jam, and a more brightly coloured product is obtained.

In order to provide jam at times when fresh fruit is not obtainable, many manufacturers produce jams made from "pulped" or preserved fruit. The fruit, when received, is put into barrels (the harder kinds of fruit are partly cooked first) with the addition of sulphur dioxide, a preservative similar to the Campden preserving tablets used for household fruit bottling, and stored until required, when the fruit is made up into



Jamaica. Map of the largest of the British West Indian Islands

in breadth. The Morant and Pedro Cays are also attached to Jamaica. The total area, with dependencies, is 4,628 sq. m.

Jamaica owes its value for the British Empire largely to its position in the Mediterranean area of the New World. The plantations early gave rise to a triangular traffic with the U.K. and Canada whereby manufactures went to Canada, timber and fish to Jamaica, and sugar and tobacco to England. This trade fell into decline during the 19th century and the islands were to some degree relegated to a backwater in relation to imperial trade routes. In the 20th century the position again changed.

Topographical Features

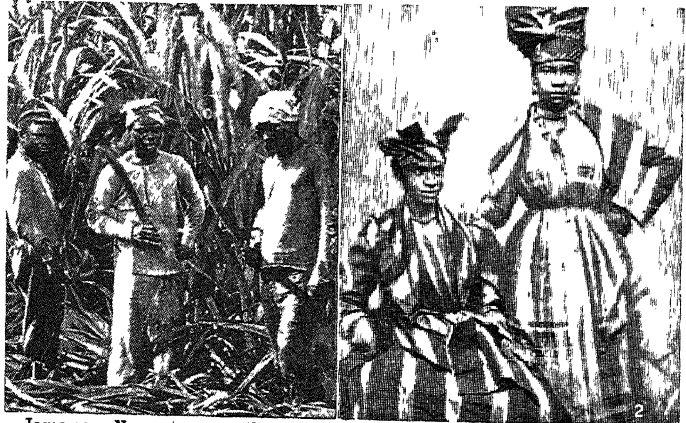
The coastline is broken by numerous inlets, forming safe harbours, the most important being Port Royal, the harbour of the capital, on the S. coast. The interior is an elevated plateau of Antillean limestone, with scattered hills, depressions or sinks, and valleys weathered into their present formation by the action of torrential rains and running streams. On the coast are shelving plains with ancient beach lines, which indicate the gradual uplift of the island. The loftiest points occur in the E., where the Blue Mts. rise to a maximum height of 7,420 ft., many peaks exceeding 5,000 ft.

The lower slopes of the mountains in the N. are covered with luxuriant vegetation, embracing pimento groves and brilliant flowering shrubs—begonias, orchids, cacti, and ferns; and the higher levels by dense forests of ebony, cedar, mahogany, fustic, logwood, lancewood, etc., the timber being an export. Other trees are ceiba, mango, and acacia. The mountains are chiefly limestone, conglomerates, and shales.

The largest inlets are Montego, St. Ann's, Annatto, and Hope

Bays on the N.; Long Bay on the W.; Holland Bay on the E.; and Black River, Old Harbour, Kingston Harbour, and Morant Bay on the S. The principal capes are N. and S. Negril Points on the W., Morant Point on the E., and Portland Point on the S. The numerous rivers are small, the longest being the Cobre, Minho, and Black, which discharge on the S. coast; others flow to the N. coast, the central mountain system forming the watershed. None is navigable, but they serve for irrigation.

Agriculture is the staple industry. Over 1,000,000 acres are under cultivation, largely let out in small holdings. Stock raising is carried on to a considerable extent. The cultivation of tobacco, coffee, and cacao has made great progress, and all tropical products flourish. Up to the Second Great War the production of sugar cane was declining to make way for banana and orange growing. This tendency was reversed in the war years, and comparative figures for export were: bananas, 1926, £2,072,195; 1943, £47,278; sugar, 1926, £654,736; 1943, £1,831,614. Rum is a valuable export.



Jamaica. Negro types in this British West Indian island. 1. Cane cutters on a sugar plantation. 2. Girls in gala dress

There is diversity but little or no extreme of climate, which is generally warm and agreeable, with average annual rainfall 44 ins. Earthquakes and hurricanes are fairly frequent. There are no indigenous mammals and only a few reptiles, including a large iguana and several species of snakes. The scorpion and centipede are poisonous. Bird life is plentiful; the commonest birds being parrots, buzzards, humming birds, tyrant birds, and the green tody. Insects abound, particularly mosquitoes and sand flies.

Jamaica is divided into three counties: Surrey in the E., Cornwall in the W., and Middlesex in the centre. The counties are subdivided into parishes. The capital is Kingston on the S. coast; it is the chief port and the present seat of government. Spanish Town, 15 m. to the W., was the old capital. Other ports and maritime villages are Montego Bay, Port Antonio, Savanna-la-Mar, Port Maria, St. Ann's Bay, and Falmouth.

Government of the Island

By the constitution which came into force Nov. 20, 1944, the governor is assisted by a house of 32 elected representatives; a legislative council, or upper house, of 15; and an executive council of ten, five appointed by the house of representatives and five by the governor. The franchise is universal at the age of 21. There is no established church. Education is carried out through public elementary schools, vocational schools and colleges, and secondary schools, largely endowed by the government. There is a high court of justice, with circuit courts, and a resident magistrate in each parish.

There are 212 m. of rly. and 2,525 m. of main road, 2,581 m.

of telegraph and 2,819 m. of telephone lines, exclusive of military lines. Regular troops supply a garrison, and a local militia comprises artillery, engineer, and infantry contingents; Jamaican units did not serve overseas during the Second Great War, but many Jamaicans joined the British forces. In 1940 several sites were leased to the U.S.A. as naval and military bases. The pop. at the 1943 census was 1,237,063, comprising 14,793 white, 216,250 coloured, 965,944 black, 21,396 East Indian, and 6,894 Chinese.

Jamaica was discovered by Columbus in 1494 and settled by the Spaniards in 1509. It remained under Spanish domination until 1655, when it was taken by a force sent out by Cromwell under Admirals Penn and Venables, and its possession by Great Britain was confirmed by the treaty of Madrid in 1670. The natives had virtually died out and the pop. at the time of capture by the English did not exceed 3,000. The island was quickly colonised by disbanded soldiers from the parliamentary army, who were governed by military laws until the Restoration. Peasants emigrated from England, Scotland, and Ireland, and the slave traffic began. The Spaniards fled to Cuba, and negroes were imported from Africa. Port Royal became a centre for the transhipment of negroes to the neighbouring islands and the mainland of America. A constitution was granted by Charles II in 1662, but abandoned four years later in favour of a governor and council, partly official and partly elective. This form of government ceased in 1866, and in 1884 representative government was established.

In 1692 most of the town of Port Royal was engulfed in an earthquake. Cyclones in 1712 and 1722 devastated it, and a fire in 1815 completed its destruction. In 1903 a hurricane caused enormous damage in the island, and an earthquake in 1907 shattered Kingston, involving the loss of 1,000 lives. *See* Cayman Islands.

Bibliography. History of Jamaica, W. J. Gardner, 2nd ed. 1909; Historic Jamaica, F. Cundall, 1915; Jamaica, Lord Olivier, 1936.

Jamalpur. Town in the Monghyr dist. of Bihar, India, lying S. of the Ganges. Workshops of the East Indian rly. employ many of the pop. of 25,700.

Jambol or **YAMBOLI.** Town of Bulgaria. It is situated on the Tunja, about 60 m. N. of Adrian-

ople (Edirne), with which it is connected by rly. and a direct high road. The chief export is attar of roses. Pop. 24,920.

Jamboree. American Indian word for a merry meeting, carousal, or joyful gathering of the tribes. Like many other Indian words and institutions, it has been adopted by the boy scouts. Great jamborees of scouts drawn from many foreign countries were held in London, 1920; Copenhagen, 1924; Birkenhead, 1929; Godolo, Hungary, 1933; Vogelenzang, Netherlands, 1937; and Moisson, France, 1947. An international scout magazine bearing this title was started in 1921. *See* Baden-Powell: Boy Scouts.

James. Largest river of Virginia, U.S.A. It rises in the W. of the state, in the Alleghenies, and flows 450 m., alternating between a S.E. and a N.E. course, cutting its way through the Blue Ridge Mts., and emptying into Chesapeake Bay at Hampton Roads. It becomes tidal below Richmond, at the head of navigation for steamboats, and 150 m. from the mouth. Liners may go up it 66 m. to the mouth of the Appomattox, the chief tributary. Falls at Richmond supply water power. The Kanawha Canal follows the river course for 200 m. from Richmond to Buchanan. The James is one of America's most historic rivers, largely because of Jamestown (*q.v.*), the first permanent English settlement in America. A bridge over the river at Newport News is with its approaches 6 m. long.

James or **DAKOTA.** A river of the U.S.A. Rising in the east-central part of N. Dakota, it flows generally S. across S. Dakota for over 450 m., and enters the Missouri river about 11 miles below the city of Yankton.

James. A masculine Christian name, really a variant of Jacob (Hebrew, supplanter). The Latin form is Jacobus, the French Jacques, and the German Jakob. It was early popular in Scotland because of its use by the Stuarts, and after 1603 became so in England. Jeames, an old spelling, is now used as a nickname for a flunkey. Jacqueline is a feminine derivative, as are the rarer forms Jacoba, Jacquetta, and, in Scotland, Jamesina.

James. Saint and apostle. A fisherman of Galilee, he was probably the elder brother of John, and a son of Zebedee. He became one of the twelve apostles. His mother, Salômé, is said to have been the aunt of Christ. He was

put to death by Herod Agrippa in 44 (Acts 12). His festival is kept on July 25. *See* John.

James. Brother of Jesus Christ. The relationship implied has been much discussed. The suggestion that Mary had children besides Christ is contrary to Christian tradition; and there is no mention of such persons in the history of the early Church. James may have been the son of Joseph by a former marriage or the cousin of Christ. He was not one of the disciples, and was converted to Christianity only after the Resurrection, when Christ appeared to him. Known as James the Just, he rose to be head of the Church at Jerusalem. He was a man of ascetic life and was the author of the Epistle which bears his name. He was thrown from a pinnacle of the Temple at the instigation of the Scribes and Pharisees, and then killed by a blow from a club, or, according to another account, was stoned to death by order of the high priest in 62 (Acts 15 and 21).

James. One of the twelve apostles. Son of Alphaeus, he is known as James the Little, to distinguish him from James, the son of Zebedee (Matt. 10; Luke 6). He shares with S. Philip a festival on May 1.

James, THE EPISTLE OF. One of the N.T. Epistles. It belongs to the group known as the Catholic Epistles, from being addressed, not to particular communities, but to Christians in general. The author is usually identified with James, the Lord's brother (*q.v.*). The fact that the Epistle is more Jewish than Christian has suggested that it was addressed to Jews rather than to Christians. The writer includes some sayings of Jesus, but is silent about His life and death. Apparently, therefore, he wished to commend his teaching and to avoid any reference to the Cross. The Epistle is democratic in tone and tenets, and has been regarded as in some respects a sort of charter of Christian Socialism. It is not referred to before the time of Origen, but is perhaps the earliest of the books of the N.T. *See* Bible; New Testament.

James I (1566-1625). King of England from 1603 to 1625; he was also king James VI of Scotland from 1567. Born in Edinburgh, June 19, 1566, he was the son of Mary Queen of Scots and Lord Darnley. In 1567 he was proclaimed king, but his personal reign did not begin until 1583. Under various guardians he was thoroughly educated, George Buchanan

being one of his tutors. He lived mainly at Stirling, his person occasionally in danger of seizure by turbulent nobles, as indeed happened in the raid of Ruthven in 1582. For twenty years before becoming king of England, James really ruled Scotland. His great work was to make the nobles subservient to the crown, no light task, but one which he appears to have accomplished. He had strong ideas on ecclesiastical matters, where his policy was to make the state superior to the church, the very opposite of that favoured by a strong section of the Presbyterians.

The death of Elizabeth in March, 1603, made James king of England. At once he was confronted with difficulties, which his own behaviour did not make smoother. The methods which had succeeded in Scotland were of no avail in a country where the law was already supreme, and the crown dependent for its supplies on the goodwill of a parliament which had no inclination to surrender a fragment of its rights to a king unacquainted with English traditions and insistent upon doctrines of divine right, which it regarded with suspicion. A serious struggle between crown and parliament was only postponed because the king preferred scolding and giving way to risking a breach with his subjects.

Down to 1612 James allowed himself to be guided mainly by the opportunist statesmanship of Robert Cecil, earl of Salisbury. These first years of his reign were marked by the disappearance of the

hopes both of the Catholics and of the Puritans, who both expected favours from him. The Gunpowder Plot in 1605 made popular opinion incurably hostile to the Romanists, while the king found his surest support in strengthening the authority of the prelates. In 1604 he brought to an end the long war with Spain, and much thought was expended in seeking an alliance between the royal houses of the two countries. Against his will, for Buckingham was now in control of foreign policy, he found himself dragged into the Thirty Years' War on behalf of his son-in-law, the elector palatine. He died at Theobalds, March 27, 1625. James married in 1589 Anne, daughter of Frederick II, king of Denmark. Three of his children were Henry, prince of Wales (d. 1612), Charles I, and Elizabeth, from whom the present royal family is descended.

James was a man of poor physique and ungainly appearance, with legs almost too weak to support him, and a tongue too large for his mouth. He showed a great partiality for certain handsome but worthless men: was untrustworthy and deceitful, tactless and thriftless, slovenly, and continually talking. On the other hand, he was one of the ablest of British sovereigns, a thinker, and probably the only one who would have won fame by his intellectual gifts alone. These gifts are seen in his writings, which include essays, poems, and meditations. Better known are his *Basilicon Doron* and his *Counterblaste to Tobacco*. His political and ecclesiastical ideas are developed in the *Basilicon*, and in a tract, *The True Law of Free Monarchies*. He also wrote *Daemonologie*, a short work against witchcraft. His works were published in 1616, and some are in E. Arber's *English Reprints*. See *Basilicon Doron*; *Divine Right*; *Gowrie Conspiracy*; *Gunpowder Plot*; *Ruthven, Raid of*; *Scotland*; *consult The First Two Stuarts*, S. R. Gardiner, 1900; *James I and VI*, T. F. Henderson, 1904; *James I*, C. Williams, 1934.

James II (1633-1701). King of Great Britain and Ireland 1685-88. The younger son of Charles I and brother of Charles II, he was born at St. James's Palace, London, Oct. 14, 1633. Throughout his brother's reign he was heir presumptive to the throne, to



James II. Statue by Grinling Gibbons, formerly in St. James's Park, London, now in Trafalgar Square

which he succeeded Feb. 6, 1685. He married first, in 1659, Anne Hyde, daughter of Lord Clarendon. Their daughters, Mary and Anne, both became queens of England. In 1673 he married Mary of Modena, the mother of his son James Edward, whose birth in 1688 precipitated the Revolution. As a young man James displayed marked courage in the field, and as admiral he was sincerely devoted to the development of the navy, though he displayed no great skill as a commander. He openly professed the Roman Catholic faith, although by doing so he endangered his prospects of succeeding his brother.

The final defeat of the Exclusion Bill and the rout of the Whigs in 1681 secured him the throne when Charles died. The rising of Monmouth proved only that a policy of moderation would ensure national loyalty; but the king did not pursue a moderate policy. He deliberately drove Anglican sentiment and constitutional sentiment as well into opposition by arbitrarily dispensing, in individual cases, with the disabilities imposed by the law upon Roman Catholics and Protestant Non-conformists, by replacing Churchmen by Romanists, and finally by the Declaration of Indulgence.

The arrest, trial, and acquittal of the seven bishops, 1688, turned public sentiment solidly against the king, and the standing army on which he relied shared the popular feeling. The belief that the son just born (June 10) to the king was supposititious decided the question. Leaders of both parties combined to invite the intervention of William of Orange, and when he



James I

(James I of Great Britain)

After Paul van Somer



James II, King of Great Britain

After Kneitter



James. Portraits of the kings of Scotland. Left to right: James I, 1406-37; James II, 1437-60; James III, 1460-88; James IV, 1488-1513; James V, 1513-42

landed at Torbay, Nov. 5, the bulk of the army went over to his side. Although it was not William's ostensible purpose to depose his father-in-law, James fled from the country and took refuge with Louis XIV of France.

Ireland, mainly Roman Catholic, provided James with a base for further effort. Thither he betook himself, but on suffering a severe, though not overwhelming, defeat at the battle of the Boyne (July 1, 1690), he withdrew to France, and the capitulation of Limerick (Oct. 3, 1691) ended all hopes from Ireland. During the next ten years James remained at his court of St. Germain, the guest of Louis XIV. His schemes for recovering his crown by an invasion with the aid of Louis were wrecked by the decisive sea fight of La Hogue (May 19, 1692). Sundry abortive plots, not always sanctioned by James himself, for the capture or assassination of William, were detected and suppressed with singular leniency. On James's death (Sept. 6, 1701) Louis acknowledged his son James Edward as lawful king of England. There are Lives by J. S. Clarke, 1816; H. Belloc, 1928; F. M. G. Higham, 1934.

James I (1394-1437). King of Scotland. The son of King Robert III, he was born at Dunfermline in July, 1394. In 1406 he was sent to France, but on the way he was captured by some English sailors, and until 1424 was a prisoner in England. His education, however, was carefully attended to.

In April, 1406, James became nominally king of Scotland, but the kingdom was under regents, and it was not until after the death of Henry V in 1422 that they took steps for his release. This was effected by a treaty, when a sum of money was paid for the king's maintenance and a marriage, celebrated Feb. 12, 1424, was arranged between him and Jane Beaufort, daughter of the duke of Somerset. During his reign James dealt sternly with the unruly nobles; Murdoch, duke of Albany, his sons and others were put to death, while steps were taken towards a more constitutional form of government. His policy, however, led to a con-

spiracy against him, and on Feb. 20, 1437, James was murdered at Perth. He left a son, James II, and six daughters, one being the wife of Louis XI of France. James won a reputation as a poet and was a man of exceptional culture. Two poems by him are extant: *The Kingis Quair* (King's Book) and *Good Counsel*, while others may be his. *Consult Romance* of a King's Life, J. A. A. Jusserand, 1897; *Life*, E. W. Melville, 1936.

James II (1430-60). King of Scotland. The son of James I and an Englishwoman, Jane Beaufort, he was born Oct. 6, 1430. He became king in 1437, and as usual, the time of the regency was one of civil discord; the Douglasses were then very powerful, one of them being regent. In 1449 James assumed power, but the trouble continued, being chiefly marked by warfare between the king and the Douglasses, caused partly by the murder of the earl of Douglas by James at Stirling in 1452. James became also involved in a war with England. Later he took up arms for the Lancastrian party therein, and was killed whilst besieging Roxburgh Castle, Aug. 3, 1460. He married Mary, daughter of the duke of Gelderland; of his three sons the eldest was James III.

James III (1451-88). King of Scotland. Born July 10, 1451, he succeeded his father James II as king in 1460. Regents governed the kingdom until about 1469, and for the rest of the time James was constantly at war with his nobles. His fondness for music and culture generally made him an unsuitable ruler for Scotland in the 15th century, and when some of the nobles persuaded his young son, afterwards James IV, to rebel, the end came. Near Bannockburn the king's army met the insurgents, but James was defeated and fled. He took refuge at Beaton's Mill, where he was killed on June 11, 1488. His wife was Margaret, daughter of Christian I, king of Denmark.

James IV (1473-1513). King of Scotland. Born March 17, 1473, James succeeded to the throne on his father's death, 1488. The comparative quiet of his reign allowed him to mix in foreign

politics to an extent unusual for a Scottish king. He had intercourse with the pope, the emperor, and the kings of France, Spain, and Denmark, and married Margaret, daughter of Henry VII of England, an alliance which led to the union of the two crowns in 1603. With his brother-in-law, Henry VIII, James soon quarrelled, and when war broke out the two armies met at Flodden, where, on Sept. 9, 1513, James and many of his nobles were killed. He was very popular with his people, and appears to have been an able and interesting, if somewhat licentious, man.

James V (1512-42). King of Scotland. Born at Linlithgow, April 10, 1512, James was not two years old when his father's death at Flodden made him king. At the age of twelve he was declared fit to rule, but one noble or other kept him in his power for some time longer. James's real reign, which began about 1530, was marked by troubles with his nobles and with England, and in 1542 the English invaded Scotland. In Nov. the Scots were routed at Solway Moss, and the king, grieving over this disaster, died at Falkland, Dec. 14, 1542. He had married Mary, daughter of the duke of Guise, and his only legitimate child was Mary Queen of Scots. Of his illegitimate children the most notable was the regent Murray.

James Edward (1688-1766). Jacobite prince, known as the Old Pretender. Born in London, June



James Edward, The Old Pretender

10, 1688, he was the son of James II, and his second wife, Mary of Modena, although stories were circulated that he had been smuggled into the palace. He was immediately hurried over to France and was living at St. Germain when his father died in 1701, and he inherited his claim to the throne of Great Britain. Several attempts were made to secure this, the most notable being in 1715 and 1745, and twice James himself sailed for

Scotland, once in 1708 and again in 1715, when he landed at Peterhead, on both occasions returning to France without disaster. In 1715, in consequence of peace between England and France, James left France for Bar-le-Duc in Lorraine, but his concluding years were spent in Rome. Since 1702 he had been under an attainder passed by the English parliament.

James married in 1719 Maria Clementina, granddaughter of John Sobieski, king of Poland, but the union was unhappy, and in 1735 Clementina died. Their family consisted of two sons, Charles Edward (*q.v.*) and Henry, Cardinal York. James died in Rome, Jan. 2, 1766, and was buried in S. Peter's. See Jacobites.

James, ALEXANDER (b. 1901). Scottish footballer. A native of Glasgow, born Sept. 14, 1901, he appeared for Raith Rovers in 1922. He entered English league football in 1925 with Preston North End, and in 1929 was transferred at a fee of £9,000 to Arsenal, with whom he became the most prominent player of his time. He was in the Cup-winning teams of 1930 and 1936, and represented Scotland in eight international matches, retiring from regular play in 1937. An inside-left who ranked with the greatest forwards, James was not renowned as a goal-scorer but as a strategist with unequalled ball control and footwork.

James, GEORGE PAYNE RAINSFORD (1799-1860). English novelist. Born in London, Aug. 9, 1799, the son of a physician, he early developed a taste for history, which found expression in a long series of romances, the first being *Richelieu*, 1829. He is



G. P. R. James,
English novelist

credited with about 100 novels in all, melodramatic and artificial, but with a flavour of romance and excitement which commended them to a large circle of readers. His fondness for opening with a description of two horsemen, one dark and the other fair, is burlesqued by Thackeray in *Barbazure* in the *Novels by Eminent Hands*. He held several consular appointments, including one at Venice, where he died May 9, 1860.

James, HENRY (1843-1916). Anglo-American novelist. He was born in New York, April 15, 1843,

son of Henry James, a well-known Swedenborgian, and younger brother of William James (*q.v.*). He was educated at Harvard, with a view to a legal career, but early turned his attention to literature, at first in the form of short stories and contributions to periodicals. The first novel to bring him recognition was *Roderick Hudson*, 1875. This was followed by some forty to fifty books, most of them novels. James excelled in delineating the contrast between the new civilization of America and the older civilization of Europe. Interested in the development of character rather than in incident, and in suggestion rather than in direct statement, he is perhaps unsurpassed in minute and subtle analysis of the psychology of his creations. His prose style is marked by the evidence of continuous selection of the exact word to convey his nuances of significance.

From 1869 he made his home in Europe, living chiefly in London and at Rye in Sussex. Naturalised as a British subject in 1915, he was given the O.M. in January, 1916, and died February 28, at Chelsea; memorials were placed in Chelsea old church and library. His novels include *The American*, 1877; *Daisy Miller*, 1878; *The Europeans*, 1878; *A Bundle of Letters*, 1879; *Washington Square*, 1880; *The Bostonians*, 1886; *The Tragic Muse*, 1890; *What Maisie Knew*, 1897; *The Turn of the Screw*, 1898; *The Awkward Age*, 1899; *The Wings of a Dove*, 1902; *The Golden Bowl*, 1905; and *Julia Bride*, 1909. James's wide knowledge of French literature is reflected in his *French Poets and Novelists*, 1878.

Bibliography. H. J., a *Critical Study*, F. H. M. Hueffer, 1913; H. J., *Man and Author*, P. Edgar, 1927; *The Pilgrimage of H. J.*, Van Wyck Brooks, 1928; *Letters to A. C. Benson and A. Monod*, ed. E. F. Benson, 1930; H. J., *The Major Phase*, F. Matthiessen, 1946.

James, MONTAGUE RHODES (1862-1936). A British scholar. Born Aug. 1, 1862, son of the rector of Livermere, Suffolk, he was educated at Eton and King's College, Cambridge. He studied classics and archaeology, became a fellow of King's, and was provost from 1905 to 1918, when he



Henry James

Hoppe

resigned on being made provost of Eton. At Cambridge he was also director of the Fitzwilliam museum, 1894-1908, and vice-chancellor, 1913-15. He wrote on Biblical and historical subjects, also editing apocryphal writings and medieval manuscripts. To the general public he was best known by several volumes of ghost stories. Many honours and in 1930 the O.M. were conferred on James, who died June 12, 1936.

James, WILLIAM (1842-1910). American philosopher. Brother of Henry James, he was born in New York, Jan. 11, 1842. Trained for the medical profession, he did not practise, but in 1872 became instructor in comparative anatomy and physiology at Harvard. In 1881 he became professor of philosophy there. He died at Chocorua, N.H., Aug. 26, 1910.

His *Principles of Psychology*, 1890—one of the most lucid, penetrating studies of the day—became a standard work, and its abridgement, *Text-book of Psychology*, was more widely read than any comparable publication. An essay, *The Will to Believe*, and *Talks to Teachers in Psychology*, both appeared in 1899. Throughout his writings James stressed the psychological phenomenon of the will to believe, as well as the pragmatic sanction of belief, and in his final years he perfected his philosophical system on that basis. Pragmatism, a New Name for Some Old Ways of Thinking, 1907, established James as a philosopher. Insisting upon the activity and creativeness of consciousness rather than upon its passive receptivity, he paved the way for the developments of the



William James,
American
philosopher

20th century psychology. Emotions, he taught, are the direct awareness of physiological changes. *Con-sult The Philosophy of William James, T. Flournoy, 1917; Introduction to the Philosophy of William James, N. M. Kallen, 1925; Letters, edited by his son Henry, 1926. See Pragmatism.*



Montague R. James
British scholar
Russell

James Bay. A large south-eastern extension of Hudson Bay, Canada. It lies between Ontario on the W. and Quebec on the E., and between lat. 51° N. and 55° N. and long. 79° and 82° 50' W. It contains numerous small islands on the E. side, and the large islands of Akimiski on the W., and Charlton in the S. The Albany, Ekwan, Moose, and Attawapiskat rivers discharge into it on the W. side, and Rupert on the E. It is 350 m. long from N. to S., with a maximum width of 120 m. The water is brackish and extremely shallow. Moose Factory lies at the end of a deeper central channel, where the tide rises 9 ft. *See* Hudson Bay.

Jameson, SIR LEANDER STARR (1853-1917). British administrator. Born in Edinburgh, Feb. 9, 1853,



Sir Starr Jameson,
British administrator
Russell

he became house surgeon and physician at University College Hospital, London, but a breakdown in health caused him to give up practice in London, and to establish himself at Kimberley, South Africa, in 1878. Here began his lifelong friendship with Cecil Rhodes, at whose invitation he gave up medical practice to act as ambassador to Matabeleland in 1889, Lobengula, the Matabele chief, having been one of his patients.

The Chartered Company being formed in 1891, "Dr. Jim" was appointed the administrator of Rhodesia. In that capacity he organized the Jameson Raid (*q.v.*), which brought him a sentence of 15 months' imprisonment, May, 1896; but he was released in Dec. owing to ill health. In 1900 he became member of the Cape legislative assembly for Kimberley. During 1904-08, as leader of the Progressives, he was premier, and played a notable part in the formation of the South African Union. Made a baronet in 1911, in 1912 he returned to England, and in 1913 was appointed chairman of the British South Africa company. He died in London, Nov. 26, 1917. A Life by I. Colvin appeared in 1922.

Jameson, (MARGARET) STORM (b. 1897). British novelist. Born at Whitby, she was educated at Leeds university. She attracted attention with a novel, *Happy Highways*, in 1920, and later works sustained her reputation as an engaging and provocative writer,



Storm Jameson,
British novelist

Jamesone, GEORGE (c. 1586-1644). Scottish painter. Born at Aberdeen, he studied under Rubens at Antwerp, and, returning to Aberdeen about 1620, established himself as a portrait painter there, and later at Edinburgh. Charles I visited the Scots capital in 1633, and gave the artist a sitting; Jamesone also painted King James I, Montrose, the first marquess of Argyll, Lady Mary Erskine, James, marquess of Hamilton, John, duke of Rothes, and John, earl of Mar.

Jamesonite. A mineral, lead sulphantimonite (2PbS. Sb₂ S₃; 51 p.c. lead, 30 p.c. antimony). It occurs in needle-like monoclinic crystals, also fibrous or massive compact, with a steel-grey metallic lustre. Jamesonite, named after Robert Jameson (1774-1854), is found in mineral veins associated with other lead sulpho-salts, some of which probably have been confused with it.

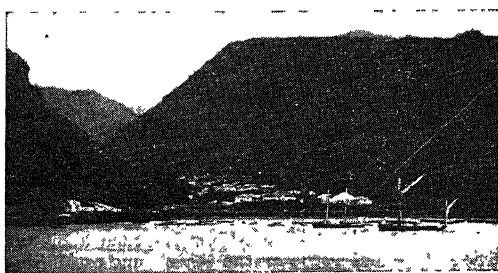
Jameson Raid. Name given to a *coup d'état* attempted in S. Africa in 1895 by Leander Starr Jameson. With the connivance and support of Cecil Rhodes, Jameson had organized a force of some 500 men consisting of Chartered Company police and volunteers, to invade the Transvaal simultaneously with a rising of Uitlanders in Johannesburg. Owing to various difficulties the Uitlander rising was postponed, but in spite of messages from Johannesburg Jameson crossed the Bechuanaland border with his men, Dec. 28, 1895. On Jan. 2, 1896, his small force was surrounded by the Boers under Cronje at Doornkop, and after being without food for 24 hours was compelled to surrender. Waiving their undoubted right to shoot Jameson and his officers as filibusters, the Boers handed them

e.g. *The Lovely Ship*, 1927; *Farewell to Youth*, 1928; *Cousin Honoré* 1940; *The Fort*, 1941; *Cloudless May*, 1943. She edited the *Journal of Mary Hervey Russell*, 1945.

over to the British authorities, and Jameson, his military chief Sir John Willoughby, and minor officers, were sentenced to various terms of imprisonment. The success of the Boers in dealing with the raiders prompted the German emperor to send to President Kruger a telegram of congratulation which aroused much resentment in Britain. The Imperial parliament appointed a select committee to investigate the raid and this issued its report July 13, 1897. It "severely censured" Rhodes, but declared the suggestion that the Colonial office had any foreknowledge of the raid to be unsupported by evidence. *See* Rhodes, Cecil; South Africa; *consult* *The Jameson Raid*, H. M. Hole, 1930.

James Tait Black Prizes. British literary prizes founded by Mrs. Janet Coats Black in memory of her husband, a partner in the publishing firm of Black. A capital sum, which by 1946 stood at £12,430, was set aside and the income from this, after paying expenses and a fee of £50 to the judge, provides two annual prizes of approximately £250 each, one being awarded for a work of fiction, the other for a biography. The first awards were in 1919, for H. Festing Jones's *Samuel Butler* and Hugh Walpole's *The Secret City*. Other notable winners were Lytton Strachey, *Queen Victoria* (1921); D. Garnett, *Lady into Fox* (1922); Arnold Bennett, *Riceyman Steps* (1923); E. M. Forster, *A Passage to India* (1924); S. Sassoon, *Memoirs of a Foxhunting Man* (1928); J. B. Priestley, *The Good Companions* (1929); F. Yeats-Brown, *Bengal Lancer* (1930); W. Holtby, *South Riding* (1936); L. A. G. Strong, *Travellers* (1945); R. Aldington, *Wellington* (1946).

Jamestown. Capital and seaport of St. Helena. It has a roadstead affording good anchorage. Longwood (*q.v.*), the residence of Napoleon, 1816-21, is 3 m. distant.



Jamestown, St. Helena. View from the sea showing the roadstead and Ladder Hill

Jamestown. City of New York, U.S.A., in Chautauqua co. It stands at the S. outlet of Chautauqua Lake, 70 m. S.S.W. of Buffalo, and is served by rly., airport, and steamer. Settled in 1810, it was incorporated in 1827 and became a city in 1886. Amid dairy farms, vineyards, orchards, and a natural gas field, it is one of the nation's leading centres of furniture making. Pop. 42,638, largely Swedish in origin.

Jamestown. Former town of Virginia, U.S.A., in James City co. This first permanent English settlement in America was founded in 1607 on a peninsula in the river James, some 30 m. from the mouth. Here in 1619 the first legislative assembly in America met, and slavery began in the original thirteen colonies. The town was destroyed by fire in 1608, burnt to the ground by Nathaniel Bacon in the rebellion of 1676, and in 1698 again partly destroyed by conflagration. Thereupon the seat of government was transferred to Middle Plantations (Williamsburg). The action of the river converted the peninsula into an island, which, with the ruins of the tower of the colony's fifth church, and the remains of a few houses, was acquired in 1893 by the Association for the Preservation of Virginia Antiquities. In 1901 the federal government built a sea wall. In 1933 the state and federal governments purchased the island as part of a national park.

Jammes, FRANCIS (1868-1938). French author. Born at Tournai, Hautes-Pyrénées, Dec. 2, 1868, he spent most of his life at Orthez, Basses-Pyrénées, and in the Basque country; his work reflects a love of nature and understanding of provincial character. His first notable volume was *Le Deuil des Primavères*, a collection of beautiful elegies, 1901. In 1902 came his masterpiece, *Le Triomphe de la Vie*, a rustic epic. The best of his later poetry is in *L'Eglise Habillée de Feuilles*. In 1905 his conversion to Roman Catholicism imposed restraint in theme and style. He continued to write prolifically until his death on Nov. 1, 1938.

Jammu. Province, district, and city in Kashmir. The city is the maharaja's winter capital, but has little commercial importance. The area of the prov. is 12,439 sq. m.; dist. 1,167 sq. m. Pop., prov., 1,597,900; dist., 326,700; city, 36,550. Jammu and Kashmir is the full official name of the state described in this work under the heading Kashmir.

Jamrach. Family of dealers in wild animals. The founder of the business was a harbour-master of Hamburg. He worked up a connexion in buying animals and curios from sailors, of which his son Charles (1815-91) disposed in Europe. Charles moved to London about 1840 and set up in business in Ratcliffe Highway, now St. George's Street, near the Docks, importing wild beasts and snakes from all parts of the world and selling them to menageries and zoological gardens. His sons, Albert (1846-1917) and William, succeeded him, but latterly confined themselves almost exclusively to the importation of rare birds into the United Kingdom.

Jam Session. Term given by jazz musicians to an occasion when, in response to a momentary mood, they follow a melodic fragment casually played by one of their number with improvised strands of melody and counter melody each on his own instrument. An arranged jam session is a contradiction in terms.

Jamshedpur. Town of India, in Bihar. Founded in 1909 as the headquarters of the Tata iron and steel works, it is about 140 m. W. of Calcutta near the Subarnarekha river. It is named after Jam Sheedji Tata, who first advocated the exploitation of the coal and iron deposits of the Sonthal jungles. These minerals occur throughout most of the Chota Nagpur plateau. Pop. 148,711.

Jamshid. Traditional ruler of Persia. He is reputed to have flourished about 1000 B.C., and his memory is associated with the possession of a magical cup that contained the elixir of life. Jamshid's cup is referred to in Fitzgerald's *Omar Khayyam*, and in Moore's *Lalla Rookh*.

Jane, FRED. T. (1870-1916). British naval writer. Born at Up-Ottery, Devon, he made some early mark as a black-and-white artist and as a novelist. In 1898 he first published the well-known annual *All the World's Fighting Ships*. The first issue of *All the World's Aircraft* came in 1909. Of Jane's novels, *The Passen and We*, 1896, and *Ever Mohun*, 1901, contained excellent studies of Devon life. He invented the Naval War Game. He died March 8, 1916.

Jane Eyre. Novel by Charlotte Brontë, published under the pseudonym of Currer Bell in 1847. It at once achieved striking popularity and established its author's reputation. By way of protest against the conventional beautiful heroines of

fiction, Charlotte Brontë determined to present one as plain and small as herself and yet interesting. She succeeded triumphantly in the presentation of Jane Eyre, the governess who tells the story in the first person, and her relations with Rochester, a big masterful man with an insane wife in the background. The book challenged attention by its frank unconventionality and by the freshness and vigour of its style. Described as an autobiography, it was to some extent that of the writer as well as of the narrator. See Brontës, *The*.

Jane Seymour (c. 1509-37). Third queen of Henry VIII of England. Eldest child of Sir John



Jane Seymour,
third queen of
Henry VIII

Seymour, of Wolf Hall, Wilts., and sister of the 1st duke of Somerset, she was a lady-in-waiting to Catherine of Aragon. Henry became enamoured of her while married to Anne Boleyn.

On the day after Anne's execution, Jane was betrothed to the king; the marriage was solemnised May 30, 1536. She was never crowned, and died Oct. 24, 1537, twelve days after giving birth to a son who became Edward VI.

Janet, PAUL (1823-99). French philosopher. Born in Paris, April 30, 1823, he became professor at Strasbourg, 1848-57, and at the Sorbonne, 1861-97. He died in Paris, Oct. 4, 1899. An eclectic and a disciple of Victor Cousin, he was a strong opponent of materialism. Matter without force is to him an abstraction; the soul is an immaterial force acting upon, and reacted upon by, the body. His general standpoint is an enlightened spiritism—the theory that soul or spirit exists apart from the body and is the only real existence. His most important works are *Materialism of the Present Day*, Eng. trans. G. Masson, 1866; *History of Moral and Political Philosophy*, 3rd ed. 1887; *The Philosophy of Happiness*, 5th ed. 1891.

Janiculum or **MONS JANICULUS**. Hill ridge on the W. bank of the Tiber. It lies to the W. of the city of Rome, and has an altitude of 275 ft. Part of it was included in the city by Augustus as the 14th section and called *Regio Trans-tiberina*. It was connected with the E. bank by a wooden bridge, the *Pons Sublicius*. Along the

river front many handsome villas were erected, inhabited for the most part by foreigners and Jews, the latter forming a community here to the end of the 15th century. It was named from Janus, a mythical king of Latium, who is said to have built a citadel on the ridge. The site is now occupied by the district of Trastevere (*q.v.*).

Janin, Jules Gabriel (1804–74). French critic and novelist, born at St. Étienne, Feb. 16, 1804. He was dramatic critic of *Le Journal des Débats*, 1836–74, and many *feuilletons* in that paper went to the making of his *Histoire de la Littérature Dramatique*, 1853–58. His other works included *L'Âne Mort et la Femme Guillo-tinée*, 1829; *Histoire de la Littérature et de la Poésie*, 1832; *Histoire de France*, 1837–43; *La Normandie*, 1844; *La Bretagne*, 1844; *Béranger et son Temps*, 1866; *Circe*, 1867. They were published in 12 vols., 1875–78. He was elected to the Academy in 1870, and died in Paris, June 19, 1874.

Janina or **YANINA**. Town of Greece. Situated on the small lake of the same name in Epirus, and near the Albanian frontier, it manufactures silks and fine ware. It is the seat of a Greek archbishop, and the cap. of Janina dist. Pop., town, 20,485; dist., 159,020.

From 1788 to 1818 it was famous as the stronghold of the Lion of Janina, Ali Pasha, who tyrannised over the surrounding country. In the First Balkan War, it was captured by the Greeks, March 5, 1913. Janina was one of the main objectives of the Italians when they crossed the Albanian frontier into Greece in 1940, and on Nov. 2 they bombed the town. The Germans occupied Janina on April 23, 1941, after the surrender of the Greek army in Epirus. It was freed by the Allies in Nov., 1944.

Janinet, Jean François (1752–1814). A French engraver and colour printer. He adopted the aquatint method, introduced by Jean Baptiste le Prince, as the basis of his experiments in colour printing in the Leblond manner by means of superimposed plates, each printing one colour. His

reproductions of contemporary or old masters enjoyed great success, and he executed a famous series of the monuments of Paris, where he was born and died.

Janissaries or **JANIZARIES** (Turk., new soldiery). Special regiments of the Turkish army. They were recruited chiefly from boys taken as tribute from the Christian subjects of the sultan. These were brought up in the Muslim faith and trained in the strictest discipline. The Janissaries also included Christian captives, and a certain number of Turkish subjects.



Janissaries. Soldier of this Turkish corps
From The Day of the Crescent, courtesy of Camb. Univ. Press

The corps was instituted by the sultan Orkhan (1326–59), was more fully developed by Murad I (1359–89), and became the flower of the Turkish army, distinguishing itself at the taking of Constantinople in 1453. In the time of Murad I the force consisted of 12,000 men; later it included a large provincial militia in addition to the Constantinople garrison, and its number reached 500,000. From the 17th century onwards the tribute of Christian boys ceased to be levied, and the Janissaries became simply a corps of picked men. In 1825 a great mutiny broke out against the sultan Mahmud II, and in 1826 the force was abolished after many members had been massacred. *See* Turkey.

Janjira. Former Indian state, about 40 m. south of Bombay city, now merged in Bombay state. Alone of the states of W. India it repulsed the Marathas. The capital was Murud, the name Janjira being given to an island fort opposite the capital. Area 379 sq. m. Pop. 117,324.

Jan Mayen Island. Volcanic isle in the Greenland Sea, belonging to Norway. Lying N.E. of Iceland, lat. 71° N., its length is 34 m. and its area is about 144 sq. m. It was named after the Dutch navigator who claimed discovery in 1611, though Henry Hudson had been there in 1607. Seal and whale fishing is carried on in summer, and there is a meteorological station, but the island is not permanently inhabited. The Wilczek (Austrian) station was established here in 1882–83. Norway annexed the island in 1929. Oxford university sent an expedi-

tion to Jan Mayen in 1947 to study its animal and plant life and its geology. *See* Arctic Exploration.

Jannings, Emil (1886–1950). Austrian film actor. Born at Rorschach, Switzerland, July 23, 1886, he was taken as a child to Görlitz, Germany, where he first went on the stage. After a period with Max Reinhardt in Berlin, he entered films under Lubitsch's



Emil Jannings, Austrian actor

direction, achieving wide fame in Vaudeville, 1926. He gave brilliant interpretations of sinister characters in the German films *Waxworks*, *Peter the Great*, and *Faust*, and later of pathetic old men, as in his Hollywood pictures, *The Way of All Flesh*, *The Last Command*, and *The Patriot*. In 1929 he was awarded the American Academy of Motion Picture Arts prize for the best actor in the U.S.A. With the advent of talking pictures, Jannings returned to Germany, where he made his greatest success in *The Blue Angel*, 1931, with Marlene Dietrich (*q.v.*). He later acted in Nazi propaganda films, and Goebbels gave him the title of state actor; but he was later acquitted by a denazification court. Settling near Salzburg, he became a naturalised Austrian, 1946, and died Jan. 2, 1950.

Jansen, Cornelius (1585–1638). Dutch theologian. Born at Acoey, N. Holland, Oct. 28, 1585, and educated at Utrecht, Louvain, and Paris, he was director of the college of S. Pulcheria, Louvain, 1617, and professor of theology, 1619. He visited Spain in 1623 and 1627



Cornelius Jansen, Dutch theologian

as representative of Louvain university; became regius professor of Biblical exegesis, 1630; and bishop of Ypres in 1636. He died May 6, 1638.

Influenced by the theological teaching of Michael Bajus (*q.v.*), a close friend of Jean du Vergier de Hauranne, afterwards the abbé de Saint-Cyran (*q.v.*), and conspicuous for his Augustinianism and his opposition to the Jesuits, he devoted 22 years to a study which resulted in his post-

humously published Augustinus. See Jansenism.

Jansenism. Name given to the teachings of the religious sect founded by Cornelius Jansen (*v.s.*). Jansen began to study theology at Louvain under Jacques Janson, a Baianist, that is, a follower of Michael Bajus (*q.v.*). He sought, and was refused, admission among the Jesuits. He wrote to Jean du Vergier, 1619–21, that he wished to restore S. Augustine's doctrine to its proper place, and was preparing opinions which would startle Rome.

When he died in 1638, he bequeathed his Augustinus for publication to a friend. He asked that no change should be made unless the Holy see, to which he fully submitted himself, should require it. The book, which appeared in 1640, precipitated the Jansenist controversy, describes the Pelagian and Semi-Pelagian heresies, and defines the Augustinian doctrine of man before and after the fall, grace, and predestination.

Jansen held that the Jesuits, especially the Spanish Molina, "harmonised" grace with free will only at the expense of saying that man could perform "naturally" good acts without the help of grace. But Jansen taught that while man, before the fall, claimed as his right those helps which should carry him to his end, the vision of God, the fall corrupted his free will and left him at the mercy of concupiscence unless a divine attraction made itself felt. These two "delectations" are "two arms of a balance": if one sinks, the other rises; and man necessarily yet voluntarily yields to whichever is operating. Since then grace may not be given, some of God's commands are impossible of fulfilment, even if a man wishes to fulfil them: and therefore Christ's death did not assure to all men grace necessary for salvation, nor can He be said to have died for all men.

The abbey of Port-Royal in France became the great Jansenist centre, less because of the intermittent influence of Saint-Cyran than because of the astonishing Arnauld family, his friends. Antoine Arnauld (le Grand: 1612–1694) was the youngest of 20 children, of whom the six girls all became nuns at Port-Royal. It was his book *Frequent Communion* which really began Jansenism in the sense of extreme moral rigorism, a religion of fear, and rarity in the use of sacraments. He was an implacable enemy of the

Jesuits, and, feeling his own style to be too clumsy, asked the brilliant Pascal (*q.v.*) to write the book known as the *Provinciales*.

In the 18th century the Paris Jansenists displayed symptoms which obtained for them the name convulsionists and deserve close psychological study. Their rival Jansenists retired chiefly to the Netherlands where in 1723 a schismatic group was formed, still existing on a small scale though its bishops have consecrated others, *e.g.* in Germany and Switzerland. The only other name to be mentioned is Quesnel (*q.v.*), whose *Réflexions morales sur le Nouvelle Testament*, 1671, contains the essence of his teaching, an extension of Jansenism. See Arnauld, Antoine; Arnauld, Jacqueline; Marei Angélique. Consult also *Histoire du J.*, by Père Rapin, 1861; Port-Royal, Saint Beuve, 6th ed., 1901; *Le Jansénisme*, J. Paquier, 1909; *Strangers and Sojourners* at Port-Royal, R. Clark, 1932; *The Origins of Jansenism*, N. Abercrombie, 1936.

Janssen or JOHNSON, CORNELIUS (1593–1664). Dutch painter. He was born Oct. 14, 1593, in



Cornelius Janssen,
Dutch painter
Self-portrait

London, possibly of German descent, and, working at first in the Netherlands, spent the greater part of his life in England, where he was known as Johnson. He worked for a time with Van Dyck, by whom his style was influenced, at the court of Charles I. Among his portraits is that of Charles at Chatsworth; others are in the National Gallery, London, and at The Hague and Rotterdam. In later life he painted at The Hague and Utrecht, where he is believed to have died. Janssen sometimes added van Ceulen after his name.

Janssen, PIERRE JULES CÉSAR (1824–1907). French astronomer, born Feb. 22, 1824, in Paris. In 1857 he went to Peru to make investigations on the position of the magnetic equator. During 1861–64 he studied solar spectra in Italy and Switzerland. After his observation of the eclipse of 1868 at Guntur, India, he announced his discovery of the gaseous nature of the solar prominences. He contrived a means of observing them in the absence of an eclipse, a discovery made simultaneously and

independently by Sir Norman Lockyer (*q.v.*). In 1875 he was appointed director of Meudon observatory, where he began a series of solar photographs published in 1904 as *Atlas de Photographies Solaires*. He died Dec. 23, 1907.

Janssens van Nuyssen, ABRAHAM (c. 1575–1632). Flemish historical painter. Born at Antwerp, he studied under Jan Snellinck. His work, of which the churches of Antwerp and Ghent contain fine examples, was esteemed almost as highly as that of Rubens.

Januarius (*fl.* 4th century A.D.). Saint and martyr. He is said to have been a native of Naples, and bishop of Beneventum in the reign of Diocletian. Having visited some Christians who had been imprisoned at Pozzuoli for their faith, he was arrested and thrown to the lions; but as they did not injure him, he was beheaded. Two phials of blood reputed to be his are preserved at Naples, and the blood is said to liquefy on certain days in May and Sept. His day is Sept. 19.

January. First month of the Christian calendar. The name is derived from Janus (*v.i.*). The Anglo-Saxons called January Wolfmonath, because wolves then became savage through hunger. The months of January and February were added to the old Roman calendar. In the U.K. this month has the lowest mean temperature. See Calendar.

Janus. In Roman mythology, a god who presided over the beginnings of things. He was thus the patron of all births, of the first month of the year, which was named after him, and of the first steps in all human activities and enterprises.

Janus was also the tutelary deity of doors and gates, both public and private. He was the guardian of the state in war, and in token of this the door of his temple at Rome stood open in time of war and was shut in time of peace. Janus was an ancient Italian deity, and was the chief god in the Roman pantheon before Jupiter was elevated to that position. In art, he is represented with two faces looking in opposite directions.

Jaora. Former state of central India, now in Madhya Bharat. Of its 601 sq. m. about half is under cultivation. Pop 116,953.



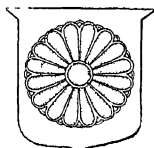
Janus, the two-faced god
From a coin

JAPAN: THE EMPIRE AND ITS HISTORY

* G. W. KEETON, M.A., LL.D.

This general survey of the "land of the Rising Sun," and of the people who live there, includes its story from the reign of the first emperor (660 B.C.) to the days of its ambitious imperialist expansion in the 20th century, which culminated in the disaster of 1945. For later events, see Novissima Verba, and for other details see the shorter articles on the islands (e.g. Honshu), cities, and towns of Japan. See also Asia; China-Japan Conflict; Pacific War, 1941-45; Russo-Japanese War

The name Japan is derived from two Chinese ideographs, pronounced Jih-pen and meaning "the Origin of the Sun," i.e. the place where the sun rises, a description naturally suggested to the Chinese by the relative geographical situations of China and Japan. The Japanese name is Nihon, sometimes pronounced Nippon, the two being different vernacular renderings of the Chinese Jih-pen. The first, usually with the prefix Dai or great, is the official designation of the empire and in general use, but there are several other terms. Yamato, the name of one of the central provinces, within whose limits the first capital of the empire was founded and authentic history began, is the oldest, and frequently occurs in poetry and oratory. Another is Oya-shima, "the eight great islands," the eight largest islands of the archipelago, exclusive of Hokkaido. Others, such as Ashi-warra no Kuni, "the land of reed plains," are even more fanciful.



Japan emblem

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Principal Islands

The empire of Dai Nihon consists of a narrow, continuous chain of volcanic islands in the N.W. of the Pacific Ocean, occupying on the E. of Asia a position somewhat analogous to that of the British Isles on the W. of Europe.

The nine chief islands are Honshu or Hondo, the mainland or main country; Kyushu or Saikaido; Shikoku; Sado, Oki, and Iki, on the W. coast; Tsu, in the straits of Korea, midway between Kyushu and Korea; Awaji, lying between Shikoku and the main island, sacred in the eyes of all Japanese as the first spot on earth to be evolved out of chaos by the gods of heaven at the creation of the world; and Hokkaido or Yezo, one of the largest of the whole archipelago, long almost unknown to the rest of the nation. The total area of Japan is 147,702 sq. m.

Honshu, the largest, wealthiest, and most populous of the islands, the site of the ancient and modern capitals and of most of the large cities, has, with its 382 adjacent small islands, 88,919 sq. m. It is

narrow in proportion to its length, 1,130 m., its greatest width nowhere exceeding 250 m., and in one part, between the city of Osaka in the S. and Wakasa Bay on the N. being 60 m.

N. of Honshu and separated from it by the narrow Tsugaru straits is Hokkaido, or northern sea circuit, with an area of 34,276 sq. m. S. of the main island, and separated from it by the inland sea, are Shikoku or the four provs., Kyushu or the nine provs.

In area Kyushu, with its 373 islands, is 16,247 sq. m. The area of Shikoku, with 167 islands, is 7,248 sq. m. The area of the remaining five great islands varies from 331 sq. m., that of Sado, to 53 sq. m., that of Iki.

To the S. are the Luchu (Japanese, Riukiu) islands, another long, straggling chain of 90 islands, total area 921 sq. m., of which Riukiu is the chief.

The Japanese empire formerly included the Kurile Is. (occupied by the U.S.S.R., 1945, under the terms of the Allied agreement at Yalta, Feb., 1945); the S. half of Sakhalin ceded by Russia in 1905 and re-occupied by the U.S.S.R., 1945; Formosa (Jap. Taiwan) and the Pescadores (Jap. Bokoto), ceded by China as a result of the war of 1894-95, restored to China, 1945, by decision of the Cairo Conference, Nov., 1943; Korea (Jap. Chōsen), occupied by Russian and U.S. forces, 1945, pending the restoration of its independence. (See entries under these heads.)

Famous Inland Sea

The archipelago is washed on its E. shores by the Pacific Ocean and on the W. by the Japan and E. China seas. The inland sea (Japanese, Seto-no-Uchi, "inside the straits") is an inlet of the Pacific Ocean, extending W. from Ku channel to the sea of Japan, with which it is joined by the narrow straits of Shimonoseki. It is the highway for steamship traffic between north and south China, on the one side, and the great shipping ports of Kobe and Yokohama, and also of the U.S.A., on the other. Studded with islands, it is one of the most picturesque seas in the world, presenting, throughout all its length, scenes of fairy-land beauty, in what appears in

many parts to be a succession of land-locked lakes. Nowhere does its width exceed 40 m., while the narrow channels which connect its more open reaches frequently fall to a width of a few hundred yards.

The islands of Japan number over 1,000, but the number inhabited is only about half. All the large islands are mountainous. Except in Hokkaido and in the great plain of the Kwanto, the mid-Eastern provs. of Honshu, there are few extensive tracts unbroken by hills and valleys, while the coastline, said to aggregate over 18,000 m., is indented except on the W. coast of Honshu. The mts. are generally not so high as those in Switzerland, though the peerless Fujiyama, a perfect cone, rising from the sea on the S. side of Honshu in an unbroken slope, reaches a height of 12,365 ft. None of the mts. is capped with eternal snow, though many are deeply covered in winter. Generally, both mts. and valleys are thickly wooded.

Mountains and Rivers

Among the mts. are many volcanoes. Some, like Fujiyama, have long slumbered, but 51, in widely separated districts, are in vigorous life, and earthquakes are frequent, often severe, and often followed by tidal waves of overwhelming magnitude. Much suffering and loss are also caused by typhoons, the violent rotary storms that, in Far Eastern seas, take the place of the cyclones and hurricanes of the E. and W. Indies and, like them, move round a circle which itself moves forward. Japan abounds in natural mineral springs, many with medicinal properties, and many of a very high temperature, in some cases reaching 212° F. They are, like the frequent earthquakes, evidence of the instability of the earth's crust, and include more than 400 well-known hot springs extending from Hokkaido to Kyushu. More than 35 of these are favourite winter resorts. In the villages such springs provide well-patronised baths.

Rivers are numerous. A stream of some degree flows through almost every valley, but where the land is narrow and mountainous they are necessarily short, and the majority so rapid in their descent

that few are fit for transport purposes, except for very short distances from their mouths. Serious inundations often ensue from their rapid overflow in the summer rains or on the melting of the winter snows, when river beds, which, in the winter, gave passage only to slender, trickling streams, are in a few days, or even in a few hours, covered with wide, raging torrents.

The "three great rivers"—the "San-dai-Ka"—in Japanese estimation are the Shinano, the Tone, and the Kiso, all in Honshu, but the longest in Japan is the Ishikari in Hokkaido, about 400 m., noted for its great salmon fisheries. Many Japanese rivers acquire entirely new names as they pass from one district to another. They furnish in abundance water for irrigation and water power for industries, and the scenery on their banks or in the rocky mountain gorges rivals the placid beauties of the Thames or the most picturesque reaches of the Rhine.

Lakes in the Hills

Lakes are less numerous, but not less beautiful than the rivers. Only one, Biwa, in Honshu, approaches in size to that of Lake Geneva. Others are insignificant in area, but of wondrous beauty. Chuisenji, at a high elevation amidst the mts. of Nikko; Hakone; Suwa, amidst the hills of Shinano; and the three Shoji lakes on the slopes of Fujiyama, all merit no less admiration than is given to Killarney or to the lakes of Cumberland or Scotland.

FLORA. Winter is the dry season, and while it lasts the grass looks parched and withered, flowers are scanty, and only the trees, the great majority evergreens, retain their verdure. With spring comes a rapid change, and thence onwards there is a continuous succession of flowering shrubs. The plum, camellia, daphne, hydrangea, the cherry, with its masses of delicately tinted pink and white blossoms, the wisteria, with its heavy purple clusters, sometimes several feet in length, the many-hued azaleas, in May-time covering whole mts. from base to summit with their brilliant blooms, the peony, the lotus, and the chrysanthemum, magnolia, meadowsweet, and highly perfumed lilies, from the gentle lily-of-the-valley to the flaunting *Lilium auratum*, are all found in their own seasons everywhere in profuse abundance.

Ferns are as abundant as blossoms. Fruits comprise apples, pears, plums, peaches, grapes, figs,

persimmons, loquats, melons, and oranges. The first four are of poor flavour, but the others, especially the oranges, are equal to the European species. The cereals are rice, millet, wheat, maize, and barley; the commonest vegetables are potatoes, beans, onions, and radishes, and tea, sugar, and tobacco are cultivated. Oak, pine, birch, elm, beech, walnut, chestnut, camphor, the silk and paper mulberry, and above all the giant cryptomeria are prominent among the indigenous trees. In few countries are tropical and temperate vegetation so mingled as in Japan, where the trees of northern Europe may be seen growing almost alongside the bamboo, sugar cane, and tobacco of tropical Asia.

FAUNA. Japan is not so rich in fauna as in flowers, though, as regards marine fauna, it is stated that the Japanese and Chinese waters are fuller of life than any other part of the ocean.

The most abundant economic fish are the anchovy and sardine, the sea bream, herring, bonito, mackerel, cuttle-fish, salmon, eel, prawn, lobster, crab, and oyster. Altogether over 600 species are known, many of them peculiar to Japan. The commonest freshwater fish are the carp, trout, eel, lamprey, gudgeon, barbel, and roach. The goldfish have peculiar trid or quadrifid tails.

Birds and insects are numerous; tree sparrows, robins, wrens, wag-tails, jays, swifts, swallows, woodpeckers, kingfishers, crows, magpies, cuckoos, and rooks are all found. Song birds are represented by the lark, bull-finch, thrush, and, above all, the nightingale. Game birds were abundant until they were almost exterminated by ruthless vandalism. They included the golden pheasant, woodcock, snipe, quail, plover, pigeon, grouse, duck, teal, and goose. Among the birds of prey are the falcon, goshawk, kite, kestrel, owl, and eagle.

Insect Life

The insects include many species of beautiful butterflies, moths, and dragon-flies. The bug is unknown, but the flea is omnipresent. The mosquito becomes a torture in the summer. The common house-fly is an even greater plague, and among the mts., where the mosquito cannot live, its place is taken by a particularly venomous gnat. Gadflies in the N., and centipedes, cockroaches, and destructive ants in the S., are other afflictions.

The principal mammals are the monkey, deer, bear, boar, fox, hare, badger, marten, and weasel

among the wild, while all the ordinary domestic animals of Europe, except the sheep and the ass, are met with. Costly but unsuccessful efforts have been made by the government to acclimatise the sheep, the offspring being utter failures as wool or mutton producers. The native horse and dog are poor, ill-tempered, and unlovable, but have been widely replaced by substitutes of more or less foreign breeding.

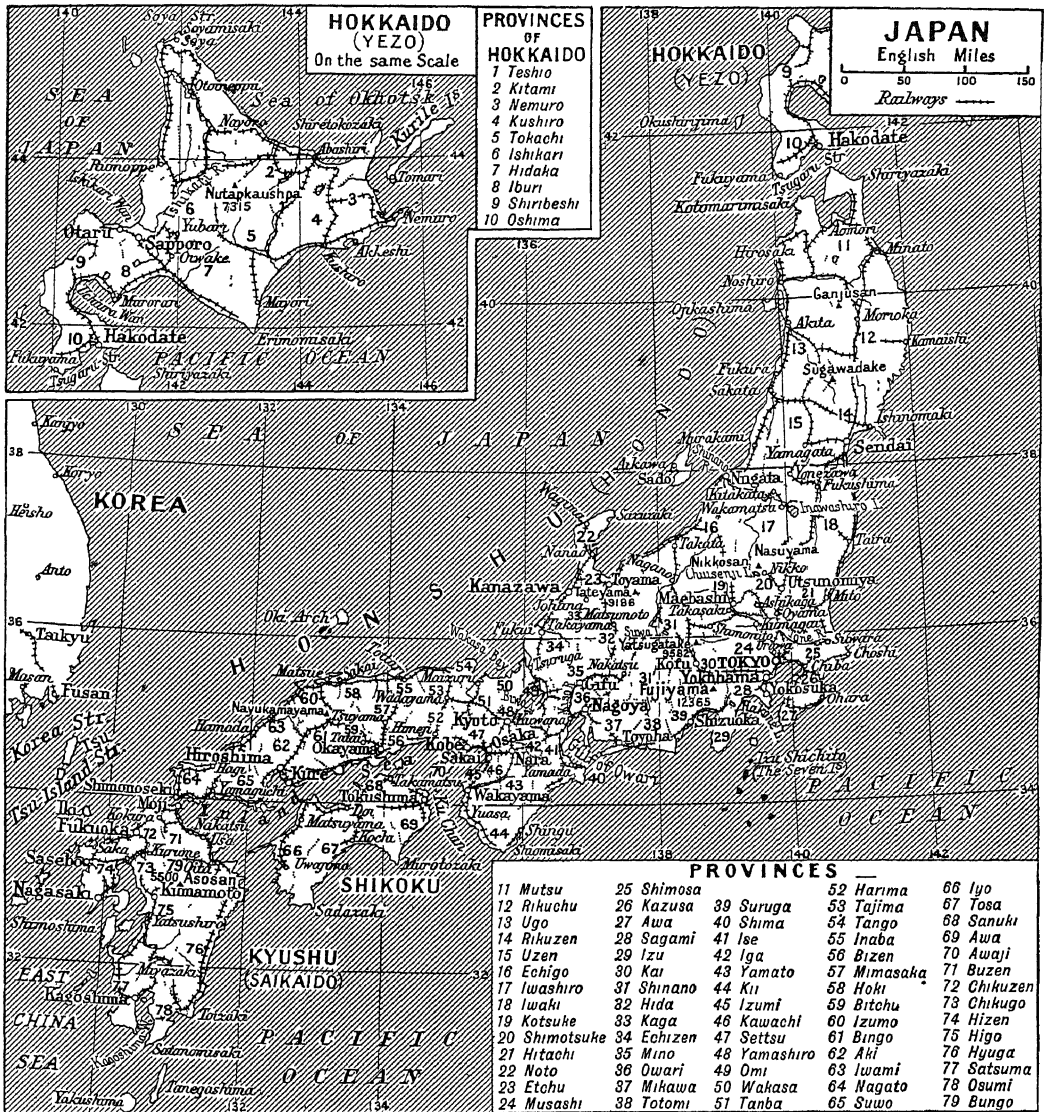
Vagaries of Climate

As regards climate, generally speaking the E. coast is milder than the W., which is exposed to the bitter winds from the Sea of Japan. Again, Japan is subject to greater extremes of heat and cold than England, and while not unhealthy for white people with sound constitutions who are temperate in food and drink and profit by the abundant facilities afforded them for outdoor exercise, it is trying to those of weak nerves and to the intemperate. Those who fall seriously ill from any cause seldom recover their full vigour without a change to Europe or America.

Consumption, lumbago, rheumatism, dysentery, typhoid fever, skin diseases notwithstanding all their bathing, are the most prevalent diseases among the Japanese themselves. They are due rather to insanitary conditions of occupation or life than to the climate.

Hokkaido is buried in deep snow during a long winter of four or five months, and the same may be said of all the provs. on the W. coast of the main island, while, except on the mt. summits, snow is unknown in the S. On the E. in the plains and valleys that slope towards the Pacific Ocean, it sometimes falls in heavy showers, but never remains for more than a few hours on the ground. Much of the comparative mildness of the E. coast is due to the Kuro Siwo or Black Stream, the Gulf Stream of the Pacific, which, flowing N. from the tropical seas S. of the Philippine Islands, strikes the coast of Kyushu in the S.E., and its main flow then skirts the whole of the E. coast until it is finally lost in the waters of the Northern Pacific. It brings with it warmth and moisture from the tropics and exercises an influence similar to that of the Gulf Stream on the shores of Great Britain.

The mean annual temperature in Tokyo, taking an average of 35 years, is 57° F., the daily summer max. 80°, the daily winter min. 30°. The highest temperature



Japan. Map of the principal islands, showing the administrative provinces and chief towns

recorded on any one day is 98° in July and the lowest 17° in Jan. The average rainfall is 60 ins., and the average number of days on which either rain or snow or both fall 160. The wettest periods are June and Sept.-Oct., the recognized rainy seasons during which rain falls in torrents and often continues without a break for several days. The climate then becomes depressing and enervating to white people, and ruinous with its mildew to clothes and furniture. The first three months of the year are cold and damp. April and May are generally delightful, but are not seldom marred by high and bitter winds or heavy showers.

Refuge can be found in hill resorts from the oppressive heat of the dog days (the Doyo) of July and Aug., but by far the pleasantest season in Japan is the autumn from Oct. to Dec.—the Koharu or Little Spring—when fine weather, bracing air, blue, cloudless skies, and an atmosphere of transparent clearness can be expected, if not absolutely relied upon.

This description of climatic conditions refers to the central provs. of Honshu, the climate of the N. being Canadian in type.

For some centuries before 1850 the pop. of Japan remained at 30 to 33 millions. This stability was due to periodic famine, pestilence,

civil war, and the practice of infanticide. Since 1850, the pop. has increased sharply, as a result of Westernisation and industrialisation, and the introduction of sanitation and efficient medical services. The pop. was about 31,000,000 in 1872; 45,500,000 in 1901; 56,000,000 in 1920; 70,000,000 in 1938; and 74,000,000 in 1943. The recent increase of a million a year created a serious problem for Japan's rulers. In the past sixty years, there has been a steady drift of pop. into the towns, leading to enormous increases in the size of the principal cities. In 1940 the pop. of Tokyo was 6,778,804 (compared with 3,000,000

in 1920); of Osaka, 3,252,340; of Nagoya, 1,328,084; of Kyoto, 1,089,726; of Yokohama, 968,091; of Kobe, 967,234. Before the Second Great War, one quarter of Japan's pop. lived in cities with over 100,000 inhabitants. Air raid damage in that war and the movement of people from wartime danger zones and to new industrial areas affected the distribution of pop. in Japan.

Attempts at Colonisation

The number of Japanese who emigrated each year to foreign countries was not large, being in the neighbourhood of 20,000. Of these nearly three-quarters eventually returned home. The attempt to colonise Manchuria was a failure, owing to the great extremes of climate there, which is unsuitable for Japanese; those remaining there at the end of the Second Great War were repatriated during 1946. The total number of Japanese living abroad in 1940 was less than 2,000,000, of whom some half million were living in the islands of the Pacific mandated to Japan after the First Great War.

In spite of rapid industrialisation, the number of Japanese employed in industry is less than half the number in agriculture. Less than one-quarter of the soil of Japan is fit for cultivation; consequently the land is parcelled up into small holdings of $2\frac{1}{2}$ acres or less. Despite the rising population, comparatively little food has to be imported. On the other hand, the intensity of food production necessitates the large-scale importation of fertilisers. Among cereal crops rice is by far the most extensively grown; other considerable crops are wheat, barley, and rye. Fruit growing is important.

Japan is poor in mineral resources. There is virtually no oil. Coal is of poor quality, difficult to

get, and limited in quantity. There is very little iron ore, which Japan must therefore import, along with most metals. Nevertheless her steel industry developed enormously during 1920-1940, with State assistance. In normal times, Japan is an importer of raw materials, of which the principal items are cotton (from the U.S.A. and India), wool (from Australia, New Zealand, and the Argentine), mineral oils (from the U.S.A. and Indonesia), iron ore, fertilisers, rubber, and timber. In exchange, she exports cotton piece goods, raw silk, woollen and silk piece goods, tinned food, and pottery. Consideration of these factors, especially in relation to the resources of Manchuria, Indonesia, and Malaya goes far towards explaining Japan's foreign policy after her Westernisation.

Principal Cities

Tokyo was the seat of the government of the Tokugawa Shoguns and a populous, prosperous, and picturesque city of great wealth and dignity, beautified by palaces, parks, temples, and mansions of the nobility. In 1868, on the restoration of the imperial government, its former name of Yedo—the river door—was changed to Tokyo, Eastern Capital, to distinguish it from Saikyo, Western Capital, a name frequently given

to Kyoto, the ancient capital of the imperial court and government. In 1869 it became the recognized capital of the new government. Along with Yokohama, Tokyo suffered enormous damage in the terrible earthquake of Sept. 1, 1923; and something like three-quarters of a million houses and much of the industrial area were destroyed by U.S. bombing from the air in 1944-45.

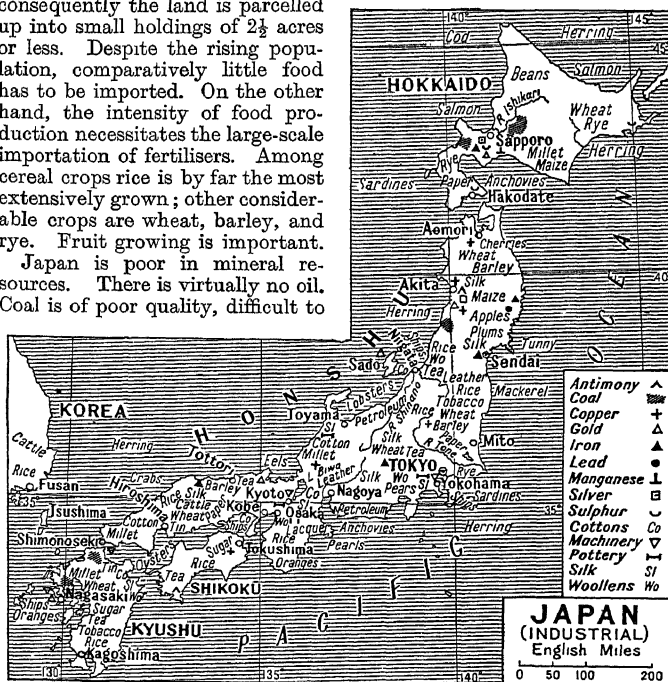
Osaka, the second largest city in Japan, has always been the chief commercial emporium, and it is a city of great political, as well as commercial and industrial, importance. In both aspects it may be called the Manchester of Japan. Its great castle, built by Hideyoshi of huge blocks of granite, fitting so exactly that no mortar was used to join them, is one of the wonders of the country. Kyoto, founded in 794, was the residence of all the long line of emperors until 1869. It lies in the prov. of Yamashiro, a district hallowed by history, in the midst of natural surroundings in which all the characteristic scenery of Japan attains the summit of beauty and variety; but it has not escaped the inroads of industry. Nagoya, a great commercial city at the head of the Gulf of Owari on the E. coast, was formerly the capital town of one of the wealthiest and most powerful of the old territorial nobility, the Daimio, whose feudal castle still stands, with its massive walls and donjons.

Great and Busy Ports

Kobe and Yokohama are great ports, whose busy harbours are always crowded with shipping. The first is the port of Osaka, the second of Tokyo. Both were once poor fishing villages, and owe all their prosperity to foreign trade.

Nagasaki, in Kyushu, destroyed by the second atomic bomb, dropped on Aug. 8, 1945, was a seat of foreign trade and residence, famous as one of the principal seats of missionary enterprise, and of the martyrdom of Jesuits in the 16th and 17th centuries; it was also the port at which trade with the Dutch was carried on during Japan's national isolation.

CONSTITUTION. The Meiji constitution of 1889, based on that of Prussia, gave the emperor full sovereignty with all executive powers, including the declaration of war and the making of peace, carried out with the advice of a cabinet chosen by himself. It instituted an imperial diet of two houses—a house of representatives and a house of peers—which could



Japan. Map showing the seaports and indicating the areas where articles of general consumption are produced

be convoked and prorogued by the emperor at will.

A new constitution, more like that of the U.S.A., and approved by the emperor and by Gen. MacArthur as head of the Allied forces of occupation, was passed by the diet in 1946 and came into effect on May 3, 1947. It substituted for the former idea of the emperor's divinity the idea that he symbolised the state and the unity of the people, from whose "sovereign will" he derived his position; deprived the emperor of his executive powers; replaced the house of peers by a house of councillors; gave women the vote and all other civic rights on the same terms as men; abolished conscription and the armed forces; and included renunciation of war.

EDUCATION. The modern school system, based upon French and American models, was introduced in 1872 and was revised and re-organized in 1886. It inculcated patriotism associated with the idea of personal loyalty to the Emperor, and attempted to carry out the hope expressed in the imperial rescript that "there may be no illiterate household in a community and no illiterate member in a household." In a humble village the schoolhouse is the most conspicuous building, far more so than the church, and all children are obliged to attend from six to fourteen years of age. Under the constitution of 1947, elementary education was made free. In 1936-37 there were at one end of the educational scale 25,840 elementary schools with 261,462 teachers and 11,566,912 pupils, and at the other, six imperial universities, with a total of 2,200 teachers and 20,907 students, and 39 other institutions of university status. Ten were then co-educational, 36 being co-educational in 1946.

In the middle schools the course extends over five years; then follow the high schools, to which admission can be obtained only by passing a severe examination. The course extends over three years and the instruction is designed for those who intend to enter a university. The average age at entry is 19½ years, and university students are therefore nearly 23 years when they matriculate. There are also normal schools and special schools for technical subjects. Foreign languages is one of the subjects to which particular attention is given, and every high school student must qualify in one at least. Female education in all its grades is amply provided for.



Japan. Ancient picturesque dress that still survives. 1. Buddhist priests. 2. A woman of Tokyo. 3. Elderly man. 4. Little girls carrying babies on their backs. 5. Jinricksha, the Japanese cab

PEOPLE AND LANGUAGE. The higher classes of Japan, who are of the pure race of the original immigrants, especially of those who in their wanderings acquired a large leaven of Malay blood, are characterized by taller stature; by slighter but better proportioned figures; by fairer complexions than in their more lowly born countrymen: by long oval faces, straight or aquiline noses, oblique eyes in deep sockets with long eyelids, finely cut features, high and narrow foreheads, and by small mouths with delicate lips, all combining to present the aristocratic and intellectual types that coloured prints have rendered familiar.

The lower classes are marked by squat figures, round, flat faces, with high cheekbones, with eyes only slightly inset, noses broad at the base and upturning so as to expose the nostrils, and large, coarse mouths with heavy lips. The

extreme types in both levels of society are still frequent and well preserved. The characteristics of the lower classes are inherited from Ainu (*q.v.*) ancestors, but, unlike the Ainu, the Japanese generally present smooth and clean faces, and hairless chests and limbs. All Japanese have the yellow skin of the Mongol, straight and coarse black hair without a vestige of curl, and prominent cheekbones.

Until their defeat in 1945, all Japanese were taught absolute loyalty to their sovereign and country. All were to be sacrificed at any moment without a murmur if occasion called. Their training made them indifferent to death or pain, ambitious, obedient, law-abiding, industrious, and frugal, with, nevertheless, a great capacity for laughter and the enjoyment of simple pleasures. Women were taught that obedience was

their lot in life an obedience to be rendered to the father in childhood to the husband in womanhood, and the eldest son in old age. Japanese women of all classes cultivated patience and gentleness, and dignity of manner.

From early times, the Japanese have been fond of physical contests, although the importance of these declined following the introduction of Buddhism. Other popular pastimes were singing, dancing, cock fighting, dog fighting, wrestling, archery, and kite flying. Among the feudal nobility, there was a great fondness for hunting. Following the advent of the foreigner in the 19th cent., the

The vocabulary, in its classical purity is singularly soft and pleasing owing to the fact that all words end in vowels, the only exception being the consonant *n*. The introduction of many of the monosyllabic vocables of China has greatly changed the language, and as now spoken by educated men it is in origin almost more Chinese than Japanese. The pronunciation of the Chinese terms is, however, so different from that in China as to make them unrecognizable.

A peculiar characteristic of the language is a very extensive system of honorifics, both words and construction varying greatly according to the rank of the person addressed.

dates from the 8th century, in which the *Kojiki* or Record of Ancient Matters and the *Nihongi* or Chronicles of Japan were compiled. These are the earliest books that survive. They are at once the histories of Japan from the creation of the world and the bibles on whose authority the national religion was founded.

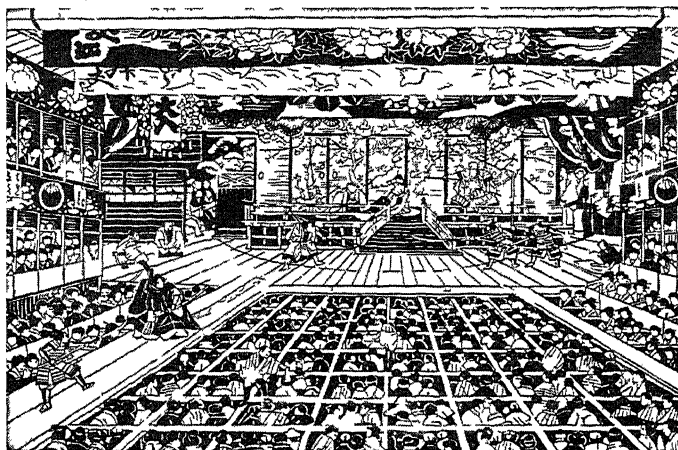
The 8th century, during which the imperial court had its home at Nara, is known as the Nara epoch in both history and literature, and as regards literature as "the golden age." The two histories were soon followed by other works in both prose and poetry.

The poetry of the Japanese consists almost exclusively of lyric odes, each of five lines and thirty-one syllables, the first four alternate lines of five and seven syllables each, and the fifth always of seven. These poems are known as *Tanka* (short poems). There are others even shorter, known as *Hokku* (first lines), which contain only three lines of seventeen syllables in all, and there are also *Naga Uta* or long poems, which may extend to thirty or forty lines, but the *Tanka* may be called the national poem. There is no rhyme, no quantity, no accentuation of syllables, and yet, without these attributes of Western poetry, results of exquisite beauty are attained.

It was in Nara that poetry attained its full maturity. The poems of the courtiers at Nara and of their successors at Heian during the next three centuries have never been surpassed. The second epoch, of both literature and history, extends from the foundation of Kyoto until the establishment of the Shogunate in 1192, and is known as the Heian period, Heianjo being the original name of Kyoto. Copious anthologies of the poetry of both epochs, compiled at the time, survive.

The *Manyōshū* or Collection of Ten Thousand Leaves contains the poems of the Nara epoch, and the *Kokinshū* or Ancient and Modern Poems, those of the Kyoto epoch. Other anthologies followed, but these two are today only rivalled in popular esteem by the *Hyakunin Isshu* or The Odes of a Hundred Poets, which contains one poem only of each author who is quoted.

The Heian epoch was not less prolific in prose than in poetry, and several works of thrilling interest as faithful pictures of the life of the time, especially the court life, have come down in their



Japan. Reproduction of a print illustrating a Japanese theatre, with its sunken boxes for the audience and the extension of the stage into the auditorium. From the drawing on wood by Tachibana Unga.

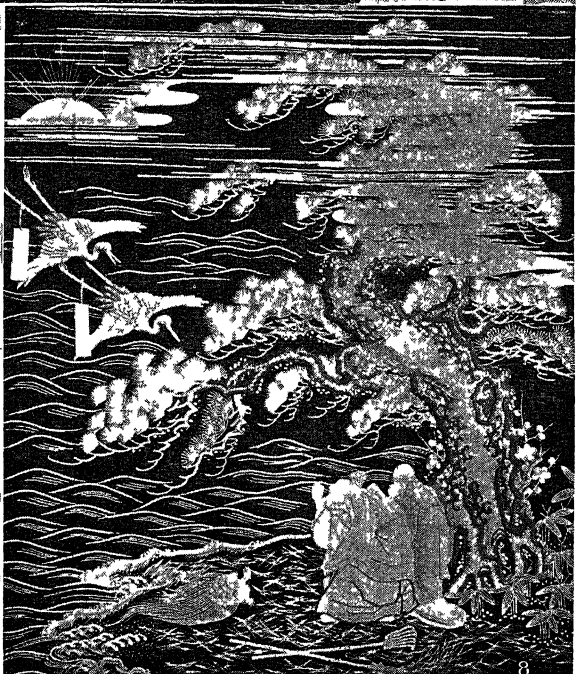
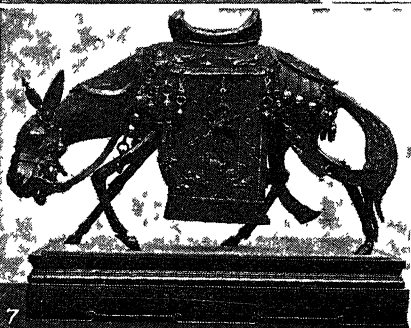
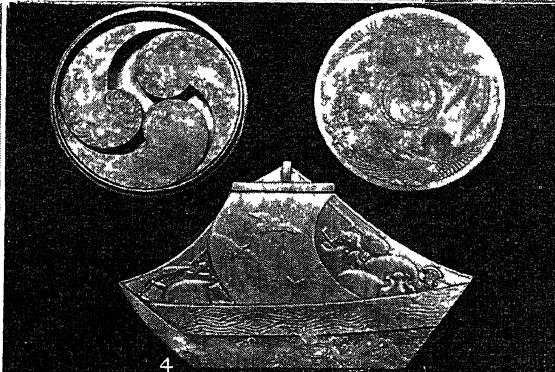
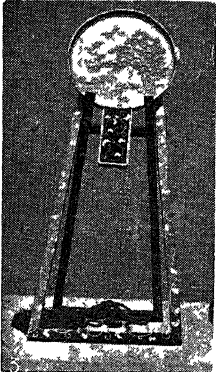
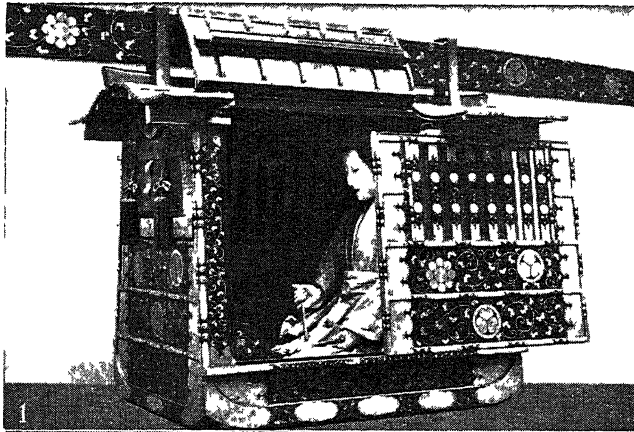
Japanese adopted most Western sports and pastimes, especially tennis (at which they scored international successes), baseball, football, and physical culture.

LANGUAGE AND WRITING. The language spoken by the Japanese belongs to the Turanian or Ural Altaic group. It is highly agglutinative, the roots and stems of words are unchangeable, and the grammatical inflexions of other languages are replaced by particles affixed to the roots. Other rules of syntax are that all qualifying words or sentences precede those which they define, the adjective precedes the noun, the adverb, the verb, the genitive, the nominative, and the explanatory the principal clause of a sentence. The objective case also precedes the verb, but prepositions follow the noun. There is no relative pronoun, no degree of comparison in adjectives, no distinction of number, person, or gender, and the principal verb invariably comes at the end of the sentence

and of the speaker. The written language varies in both construction and vocabulary so widely from the spoken that it is not a great exaggeration to say there are two languages, and some pedants say there are four. The system of writing is that of China, in which each word is represented by an ideograph.

The Japanese have supplemented the ideographs by two syllabaries, devised by themselves, but the use of the ideographs is so general that a knowledge of no fewer than 4,000 is required to give real facility in reading current literature. As each ideograph is written or printed in several forms, contracted from the original, the difficulty of learning to read or write Japanese is very great indeed.

LITERATURE. The difficulties of their language and the long years of unremitting toil that have to be spent in learning to write or even to read have not prevented the Japanese from producing a very extensive and varied literature. It

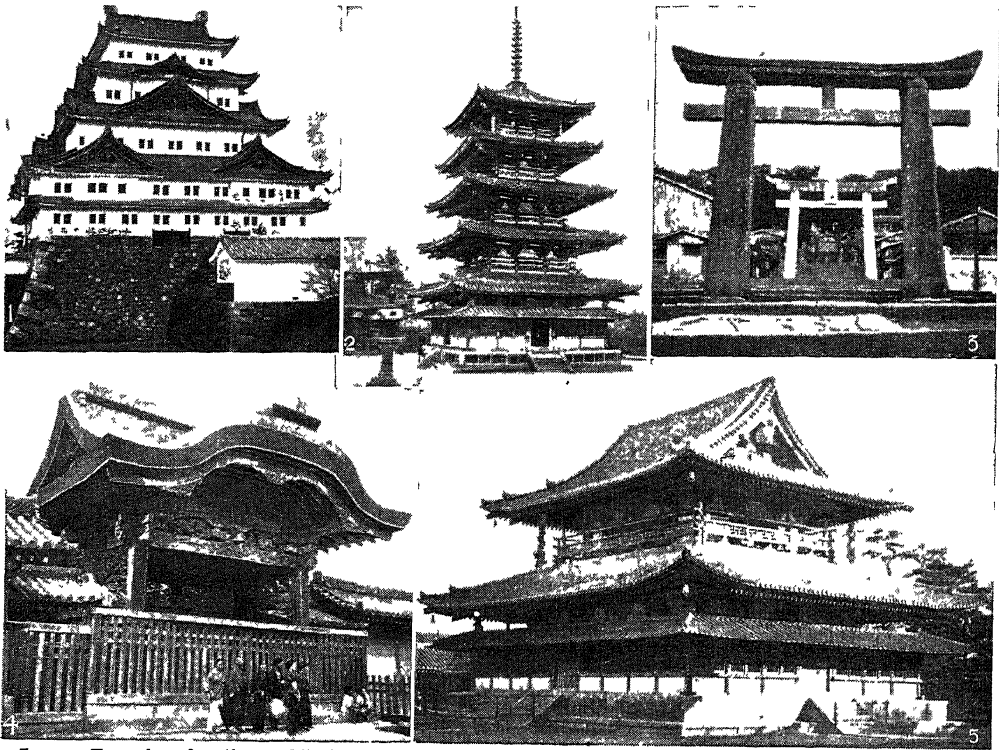


1 Sedan chair lacquered black and gilt, 19th century
2 Bronze figure of a Bodhisatva height 10 ft 8 ins
3 Hand mirror on stand, showing decorated back
4 Lacquered sweetmeat box in the form of a ship

above perfume box containing three smaller boxes and cover 1622 49 5 Bronze lantern from a temple 1776 6 Kettle of cloisonné enamel on copper 7 Bronze incense burner 8 Embroidery on black silk velvet

JAPAN EXAMPLES OF WORK IN LACQUER, BRONZE, ENAMEL AND EMBROIDERY

By courtesy of the Director Victoria & Albert Museum



Japan. Examples of native architecture. 1. Nagoya Castle, built in 1703. 2. Pagoda of Kofuku-ji, a 7th century temple at Nara. 3. Bronze torii, or arch, at Suwa temple gate, Nagasaki. 4. Gate of Nishi-Hongwan-ji temple, Kyoto. 5. Main hall of temple at Horyu-ji, Nara, the oldest Buddhist temple in Japan, 568-607

complete form. These works include diaries, essays, random thoughts, historical novels, and histories and romances, many the work of court ladies, best known, perhaps, being *Genji Monogatari* by Murasaki Shikibu, completed in 1004, and made available to readers of English in Arthur Waley's 6-vol. trans., *The Tale of Genji*.

During the wars of the Middle Ages, when arms was the sole profession of a gentleman, literature fell into abeyance, and its feeble life was preserved only by the Buddhist priests. It fell to its lowest ebb under the dictatorship of Hideyoshi, an uneducated, ignorant man. Iyeyasu, the founder of the Tokugawa shogunate, was in every way the opposite. He collected great libraries and literature soon revived with all its archaic strength.

From the beginning of the 17th cent. there was a renewed flow of literary works. History, theology, morality, drama, fiction, travels, guide-books of wonderful variety, philology, curious encyclopedias, many illustrated with artistic skill, are all represented.

All poetry is still written in the classic language of old Japan.

Chinese vocables have no place in it, but Chinese has had an all-powerful influence on Japanese prose literature, in both expression and thought. Many serious works are written in pure Chinese just as in Europe many used to be in Latin, and in nearly all works there is a large admixture of words of Chinese origin. The lighter literature under the Tokugawa was deeply tainted with pornography, a characteristic which it shared with painting, but after the advent of Europeans a new school sprang up which is free from it, and Europe had its influence on the literary as well as on the material civilization of Japan. The works of European writers, from Macaulay and Bulwer Lytton to Herbert Spencer and Bernard Shaw, Washington Irving, Tolstoy, Zola, and a hundred others, were translated and read, and had their influence in moulding Japanese literature. There was a great daily press; numerous weekly and monthly reviews dealt with all possible aspects of life and thought.

ART. Japanese art must not be judged by Western canons. It has its own convention and its own

impressionism, and may be described as a cunning blend of both features. Its charm lies in its decorative values and colour harmonies, so delicate and elusive as to be untranslatable into black and white. By this mastery of line and stroke and touch Japanese artists have carried suggestion to its farthest limits, and their methods, seemingly so simple, tempt one at times to regard their craftsmanship as freakishness or trickery. But the consummate effects achieved merely illuminate anew Horace's maxim that the function of art is to conceal art. For the Japanese artists have deliberately worked out their own salvation in their own way by their own genius; ostentatiously defying some of the most vital elements—perspective and chiaroscuro, for instance—that are believed necessary to great and worthy pictures.

Painting was introduced with Buddhism in the 6th century, but 300 years passed before a native artist of outstanding ability appeared in Kōsō no Kanaoka, the father of Japanese pictorial art. The priest, however, still laid a heavy hand upon artistic genius,

but, oddly enough, it was a priest who broke the long spell of mediocrity. This was Meicho, or Cho Densu of Kyoto—Cho the Priest (1351-1427), a painter of originality and vigour. The revival was confirmed by Josetsu, whose skill and sympathy as a teacher made the 15th century an important era.

His influence was continued by Shiubun, who possessed the extraordinary faculty of suggesting "colour in monochrome and chiaroscuro without a true shadow." Sesshi (1420-1507), another of Josetsu's pupils, originated the practice of completing the outline of figure work at a single stroke of pencil or brush, and had such a love for monochrome that he used colour only by way of exception. Kano Masanobu (1423-1520), the third notable pupil of Josetsu, founded a school which borrowed enhanced lustre from his son Kano Motonobu (1476-1559), while his great-grandson, Kano Tangu (1601-74), a bold impressionist even in the realm of impressionism, was for a period the last of a long line of geniuses.

Of the so-called Popular school, which arose in the 16th century

and which concerned itself with everyday affairs and caricature, the ablest exponents were Hishigawa Moronobu (c. 1646-c. 1716), whose sketches of contemporary manners and customs are invaluable, and incidentally, through the medium of their dissemination, materially advanced wood engraving in Japan; Hanabusa Itchō (1651-1724), a daring innovator, who freely introduced wit and humour into his drawings of open-air life; and Ogata Kōrin (1657-1716), one of the most personal painters of his country, more Japanese than the Japanese. The boldest assault on the classical school, however, was initiated by Maruyama Okio (1733-95), who established a school in Kyoto expressly to practise naturalistic art, and whose efforts were loyally supported by Mori Sosen (1747-1821), Mori Ippo, Hoyen, and Ki Kuchi Yosai (1787-1878). The last named's rendering of the human figure was characterised by unusual power and refined colouring, while the other three devoted their attention to animals and flowers, their pictures frequently exhibiting wonderful observation and delicacy of touch.

Hokusai and Hiroshige

But the greatest painter yet sprung from the people was Hokusai (1760-1849) of Tokyo, who found endless subjects in man and nature—his many views of Fuji are famous. He had a unique gift for composition, and his taste, feeling, and imagination were impeccable. As an illustrator of books he was without compeer, and he left 14 vols. of *Mangwa* (Rough Sketches) of priceless value to students. With him may be bracketed Hiroshige (1797-1858), whose prints from colour blocks have acquired a universal reputation, and Shofu Kyōsai (1831-89), a fine draughtsman whose flights of vivid and audacious fancy and turn for pungent caricature were inexhaustible. Many Japanese have worked in the European manner, but the mode has proved unsuited to the traditions and genius of their art, and so far the results have not justified the experiment.

HISTORY. Japan was inhabited, before history begins, by a people known as the Ainu, of whom only a few thousand survive, scattered through the villages of Hokkaido and the Kurile Islands. They



Japan. 1. Dwelling-house of a well-to-do family. 2 and 3. Reception rooms, with painted ceilings and paper panelled walls made to slide back. 4. Tea party

were gradually driven from their lands by invaders of a far higher degree of intelligence and civilization, the ancestors of the present Japanese people, who arrived in two great bodies at widely separated intervals. The first landed in what is now the prov. of Izumo in the S.W. of Honshu, having come by way of Korea from the central plateau of Siberia. The second also started from Siberia, reaching Japan after far longer wanderings.

By land they traversed China as far as its extreme S., and by sea they crossed to the Philippines and Formosa, whence, with the aid of the Kuro-siwo, they reached the present prov. of Hyuga on the E. coast of Kyushu. This body acquired, during its wanderings, a large mixture of Malay blood, but that the remote origins of both bodies of invaders must be found in one and the same race is clear from the fact that when the two met, long years afterwards, in central Japan, their languages and customs were so similar that no difficulty was experienced in their fusion into one nation.

Beginnings of History

Both gradually advanced into what is now known as the five home provs., the Go Kinai, that lie around Kyoto, and there met. The southerners were under a capable leader named Jimmu, who was strong enough to constitute himself the first emperor of Japan. He established his capital at Kashiwabara in the present prov. of Yamato, and there ascended the imperial throne in 660 B.C.

From that date Japanese history began, and from Jimmu all succeeding emperors down to the emperor Hirohito, the 123rd of his dynasty, trace their descent in an unbroken line.

This is the prosaic story founded on slender but plausible hypotheses. The Japanese story, believed by many despite the emperor's repudiation of divinity in 1945, is that Jimmu was the direct descendant in the fourth generation of the grandson of the Sun Goddess. He, commissioned by the goddess to assume command of all the earth, and attended by a long train of followers, descended from heaven at Mt. Takachiho in Hyuga, at the base of which Jimmu was born and passed his youth and early manhood. Hence he started on the expedition which, after many miraculous adventures, ended in Yamato and the imperial crown. The Sun Goddess was herself the

daughter of the creators of heaven and earth. It is this descent that vested the emperor with the element of divinity that made him, with all his mortal humanity, a god on earth, to whose wisdom and benevolence were ascribed every good thing achieved by his people, either in war or peace.

The land over which he reigned was the first on earth to be evolved out of chaos at the creation, and was therefore the best and the most beautiful of all lands, the land of the gods, to be venerated along with the sovereign, the two being so indissolubly associated that a separate conception of either was impossible. The people shared in the divine descent, as the descendants of the retinue of the Sun Goddess's grandson, and they were therefore the sole people fit to dwell in that glorious land.

On these theories, accepted by Japanese of all degrees with unquestioning faith, the foundations of the national religion, Shintoism, were built.

Shintoism, which signifies "the Way of the Gods," was thus directly transmitted in primeval ages from the gods of heaven. Its cardinal elements were ancestor and nature worship; the worship, first of all, of the Sun Goddess; of the past and living occupants of the throne, her direct descendants; of the deified spirits of dead heroes and scholars who had contributed to the making of Japan; and lastly, of their own individual ancestors by every family in the land. In nature, whatever is beautiful or terrible was worshipped; mountains and rivers, wind and sea, fire and flood, earthquakes and storms. The Shinto gods and goddesses could be numbered by hundreds of thousands.

Introduction of Buddhism

Buddhism was introduced from Korea in the 6th century, and speedily gained an influence which it never lost. The two religions were not antagonistic, the first Buddhist missionaries assimilating rather than destroying the ancient faith, and both were observed.

In the 13 centuries after the death of Jimmu in 585 B.C., no fewer than 35 emperors and empresses succeeded him on the throne. All records of their reigns are founded on tradition. It was not until the 5th century A.D. that Japan acquired the art of writing, and it was not until the 8th century that any written compilation was made of the national annals.

In that century, two great reforms were completed, one in the national, and the other in court life. Intercourse with Korea and, later on, with China, had been constant during the two previous centuries, and its results were a steady flow of Korean missionaries, both priests and nuns, from Korea to Japan, and the conversion of both the Japanese court and the nation to Buddhism. This was perhaps the most wholesale religious conversion in the world's history; along with it came a still more wholesale conversion in the national life.

What Japan Owed to China

Japan adopted, *en bloc*, all the elements of Chinese civilization, which, even in those days, was already of a high standard of intellectual and refined culture and capable statesmanship. It had been already fully assimilated by Korea and it steadily filtered into Japan. The Chinese system of philosophy, literature, law, education, and statecraft; the arts of writing, painting, architecture, and music; the sciences of medicine, astronomy, almanac making, and geography—also of astrology and geomancy—were as fully assimilated as were the principles and products of another civilization in our own times. What Japan learned from China in those days continued to be, for 11 centuries, the foundation of the whole of her own national life.

Then the Dark Ages came to an end; and the mythical and miraculous stories of the past began to be replaced by reliable written records of real events. Hitherto life had been tribal, even nomad; now court and government acquired, for the first time, a permanent home. A capital city was founded in 708 at Nara, and the court became a centre of refined and gentle life. In 794, not far from Nara, a new city was founded, which in turn became the capital. It was at first called Heianjo, the "City of Peace," but soon became known as Kyoto, "the Capital," and under that name continued to be the imperial capital until 1868.

The reformation in the national life had its reflex in the court. Indolent occupants of the throne, immersed in religion, poetry, and art, sometimes in mere sensualism, allowed the active administration and all real power to fall into the hands of the leading family of courtiers, the Fujiwara. For 400 years this family ruled both court and empire, absorbing among themselves every civil office of dignity or emolument. Then they,

too, sank into the indolent and effeminate sensualism to which they had reduced the emperors. All military service was left to other families, two of whom, the Taira and the Minamoto, under great leaders, gradually absorbed between them all the fighting men and strength of the empire. The two families turned their arms against each other, and a civil war began which lasted for 30 years.

Twelfth-Century Dictator

It was fought with all the merciless cruelty of the times; it was also characterized by countless romantic episodes, and some who shared in it became the darling heroes of Japan. At first the Taira were triumphant, but fortune changed with the death of their great leader, Kiyomori, and the turn of the Minamoto came. The Taira were destroyed, the final blow being given to them at the great naval battle of Dan no Ura, fought in the straits of Shimonoseki in 1185, and Yoritomo, the Minamoto leader, became dictator of the empire, under the title of Sei-i-tai-shogun or "Barbarian-repressing, great general." He assumed not only the military, but the civil power, fixing his residence at Kamakura, a new city, which quickly, under his aegis, became prosperous and populous. Here he laid the foundations of the dual government of a recluse emperor at Kyoto and a mayor of the palace at Kamakura or Yedo, and of the feudal system, both of which lasted from his time (1192-99) until the restoration in 1868.

This may be said to be the second great epoch of reform in Japanese history. The first was that which culminated in the introduction of Chinese civilization. The second was that now accomplished by Yoritomo, hardly less pregnant in its national results than the first. It was now that the military class became clearly defined as a distinct hereditary and highly privileged aristocratic caste, apart from and far above the rest of the people, and a social system was established which was destined to exercise a profound influence on the history of the nation.

The dynasties of the Shoguns changed, but the Shogunate continued unchanged till the imperial restoration in 1868. Yoritomo's direct descendants did not long survive him, and the great dignity which he had founded passed into other families, the Hojo, the Ashikaga, and finally to the Tokugawa. The Hojo were content with the authority without the title, but

both the Ashikaga (1333-1573) and the Tokugawa (1598-1867) held both title and power.

There was one brief interregnum (1570-98), when the country came under the rule of two great military adventurers, Nobunga (1570-82) and Hideyoshi (1582-98), neither of whom held the title himself, nor followed the example of the Hojo in causing it to be conferred on others. Both, however, exercised all the real power of the Shogun, and Hideyoshi, perhaps one of the greatest statesmen and generals of the world, who is unique in Japanese history as having risen from the very lowest and poorest classes of the people to the highest rank attainable by a subject, and who is often called the Napoleon of Japan, first united the empire under a strong central government.

Throughout these centuries Kyoto continued to be the residence of the emperor and the acknowledged capital. The emperor also continued to be the legitimate sovereign, the source of all legal authority, and the fountain of honour. But he was bereft of all real power, and was the helpless tool of whatever military master happened to be supreme. In his palace at Kyoto he was shrouded by a veil of impenetrable mystery, invested with every element of sanctity, with a degree of reverence that did not fall short of that rendered to the gods of heaven, whose direct descendant he was; but he was almost a myth in the daily life of the people.

Era of Feudalism

The Shogun, the dictator, first at Kamakura, then afterwards at a district of Kyoto, and finally at Yedo, was a very real presence ever before them in all the might and magnificence of his borrowed majesty. He owned large estates, which yielded him a royal revenue, and the rest of the empire was parcelled among feudal lords, the majority of whom sprang from soldiers of fortune, on whom great estates, in some cases whole provs., were conferred as rewards for their military services to the Shoguns whom they followed during the civil wars. These feudal lords were the Daimio, the territorial, or feudal nobility, rich and powerful in their several degrees, as distinct from the Kuge, the more blue-blooded nobility of the court, scions of imperial lineage who, with all their pride of birth and rank, were as poor and helpless as their imperial master.

The Daimio lived in semi-regal state on their fiefs, each of which

was a microcosm of the Shogun's splendid court at Yedo. Like him, they had great fortified castles in which they lived surrounded by a greater or lesser number of hereditary fighting men, amounting to tens of thousands in the cases of the more wealthy. They owed loyalty and homage to the Shogun, and could be called upon by him to render an account of their stewardship, but, with those exceptions, each one ruled his fief as an independent quasi-sovereign, making and administering his own laws, issuing his own currency, and exercising the higher and lower justice.

Position of the Samurai

The fighting men were the Samurai, retainers of gentle birth, whose sole profession was that of arms, who alone in the nation had the privilege of wearing them, and who owed direct allegiance only to their own feudal lords. Below the Samurai, came, in order of social rank, farmers, artisans, and traders, who were mere serfs, of no account whatever in administration or politics. They were bound by rigid sumptuary laws and had no political rights.

The great historic events of this period were the attempted invasion by Kublai Khan, the great Mongol conqueror of continental Asia, in 1281; the first arrival of Europeans, the beginning of foreign trade, and the introduction of Christianity in the last half of the 16th century; the proscription of trade, except with the Dutch, and of all intercourse with Europeans, and the extermination of Christianity by a persecution as ruthless and as wholesale as that of Nero, in the first half of the 17th century; the invasion of Korea (1592-98) by Hideyoshi; the arrival of Commodore Perry in 1853, with a powerful fleet, soon followed by English, Russian, and French emissaries; the consequent abandonment by Japan of her policy of isolation, and the opening of the country to foreign trade and residence in 1859.

Japan's domestic history was one of frequent, almost perpetual civil war until Iyeyasu consolidated his power in 1615. From that date the empire enjoyed unbroken peace, both foreign and domestic. It had its own high degree of refined and artistic civilization, and its own industries, which amply satisfied all its ethical and material requirements. If the mass of the people were serfs, they were unconscious of any disability, and were happy in the paternal government of those above them. Japan had,

perforce, to yield to the demands of Europeans backed by heavy guns, and to open the land of the gods to their trade and residence.

After 250 years of peace, civil war broke out once more. It was fought with much bitterness and bloodshed, but its end was the utter destruction of the great political fabric that had lasted for seven centuries—the downfall of the administration of the Shogunate and the restoration to the emperor of all the executive functions that were his undoubted constitutional prerogative. The feudal system soon followed the dual system of government. The fiefs with all their appanages were delivered up to the emperor; the feudatories and the Samurai were temporarily pensioned and absorbed in the general mass of the citizens.

Reforms and Modernisation

The restoration of the emperor in 1868 had deeper implications than appeared at the time, however. The rule of the Shoguns had always been resented by the most powerful of the clans, especially those of S. Honshu and Kyushu, which acquired strength from the widespread discontent following foreign penetration. Whereas the Shogun's party set their faces against reform, and hoped at a favourable opportunity to bring about a general expulsion of all foreigners, the opposing clans took the general line that the Japanese should learn all that the foreigner had to teach them, so that in due course Japan would be able to deal with foreign nations on a footing of equality. The southern clans won, and Japan was modernised at great speed. Moreover, the southern clans were able to achieve their policy behind the façade of the emperor's prerogatives, which were reasserted in opposition to the powers usurped by the Shoguns. It therefore came about that from the beginning the emperor was identified with the successful policy of reform, from which Shintoism acquired a renewed strength. Further, the southern clans were able to establish their control over Japanese public and commercial life, as well as over the services. That control survived, virtually unimpaired by a sham parliamentarianism, down to Japan's defeat in 1945.

From the first days of westernisation, Japan pursued a policy of territorial expansion in E. Asia. As early as 1874 an expedition was sent to Formosa, and shortly afterwards Japan annexed the

Luchu (Riukiu) Is. Japan then turned her attention to Korea, which was nominally subject to Chinese suzerainty, and in which most of the European powers were also interested. Conflicting Chinese and Japanese policies were the real cause of the China-Japan war of 1894, in which Japan was completely successful. The prizes of victory were Formosa, a substantial war indemnity, and the recognition of Korea's independence by China. Japan had also hoped to secure a lease of the Liautung peninsula, but this was prevented by the action of Russia, Germany, and France. In 1898, Russia herself secured a lease of part of the peninsula.

During the boxer rebellion in 1900, Japan sent a contingent to cooperate with the other treaty powers in the relief of the legations, although she watched the progressive occupation of S. Manchuria by Russia with the greatest anxiety, which was increased further by the refusal of Russia to withdraw when the boxer rebellion had been suppressed. Japan realized that before she could expand in Korea and S. Manchuria she must first defeat Russia. War broke out in 1904, following the refusal by Russia to withdraw from various Manchurian cities. Japan's policy was undoubtedly assisted by her alliance with Great Britain, by which Great Britain undertook to come to her assistance if some other power joined Russia. The war again resulted in a complete victory for Japan, and in consequence Japan took over Russia's base of Port Arthur, together with Russia's extensive rights in S. Manchuria. In 1910 Japan annexed Korea without opposition.

First Great War Activities

The First Great War, in which Japan joined the Allies, permitted her very greatly to strengthen her position in E. Asia, more especially as the outbreak of revolution in China in 1911 had weakened that country still further. Japan took over the German leased territories of Tsingtau in Shantung, whilst in 1915 she presented her twenty-one demands to the Chinese government which were accepted, and gave Japan very extensive rights, especially in Manchuria and N. China. Moreover, with Japanese connivance, Marshal Chang Tso-lin had established himself as the virtually independent ruler of Manchuria, and the separation between Manchuria and China continued down to 1923,

when Chang Tso-lin was assassinated, and his son and successor adhered to Chinese nationalism, in opposition to Japanese advice. The result was the attack by Japan on Manchuria, 1931, and her establishment of the puppet state of Manchukuo, with the last Chinese emperor, Pu-yi, as its emperor.

Pearl Harbour and After

Between 1933 and 1937, Japan unsuccessfully sought to detach the five N.E. provinces of China proper, and to establish them as a second puppet state. These intrigues were foiled by the Nationalist government of China, whereupon Japan tried to bring the whole of China under her control. Hostilities broke out in 1937, but in spite of Japanese victories, and the loss of virtually all China's coastline and her rly. and river systems, the Chinese continued to resist until the Japanese attack upon Pearl Harbour in November, 1941, merged the China-Japanese conflict (*q.v.*) in the Second Great War. By this date Japan had decided to make a bid for the mastery of E. Asia and the Pacific, and for a time spectacular successes appeared to make this a possibility. However, the very completeness of her initial successes multiplied her problems of communication and supply. The invasion of Australia proved beyond her capacity, and from the moment that her troops began to give ground before American and Australian forces in New Guinea, her defeat was assured. She surrendered unconditionally in Aug., 1945. (For the course of the fighting, see Pacific War.)

In consequence of her defeat (the first in her history), Japan lost all the overseas possessions she had gained between 1875 and 1945. Moreover, the Allied (chiefly U.S.) occupying forces effected changes in the whole social and political structure of the country. Although the emperor was retained for the time being, the ultimate political structure of Japan remained a matter for speculation. All forms of emperor-worship were prohibited, the emperor himself repudiating his divinity in an imperial rescript of Dec. 31, 1945; and free elections for the legislature were held, although the ability of the Japanese to work a genuine parliamentary system successfully had still to be tested. The occupying power made vigorous efforts to discredit the great clans who controlled Japanese public and commercial life from the restora-

tion in 1868 onwards—with what success could be apparent only after the shock of defeat had passed. See N.V.

Bibliography. The Pictorial Arts of Japan, W. Anderson, 1886; Colloquial Japanese and Japanese Handwriting, B. H. Chamberlain, 1888; Japan in Transition, J. S. Ransome, 1899; A History of Japanese Literature, W. G. Aston, 1899; Things Japanese, B. H. Chamberlain, 1890; The Mastery of the Pacific, A. R. Colquhoun, 1902; Tales of Old Japan, A. B. Mitford (Lord Redesdale), 7th ed. 1903; Shinto, The Way of the Gods, W. G. Aston, 1905; The Story of Old Japan, J. H. Longford, 1910; The Creed of Half Japan, A. Lloyd, 1911; Japanese Poetry, B. H. Chamberlain, 1911; Japan and the Japanese, J. H. Longford, 1912; A History of the Japanese People, F. Brinkley and D. Kikuchi, 1914; Japan, Story of the Nations Series, D. Murray, new ed. Longford, 1920; Japan Real and Imaginary, S. Greebie, 1920; History of Japan, J. Murdoch, 3 vols., 1925; The Civilization of Japan, J. I. Bryan, 1927; Japan's Continental Adventure, C. C. Wang, 1940; Japan in the World Crisis, C. J. Stranks, 1941; China, the Far East and the Future, G. W. Keeton, 1943; Behind the Japanese Mask, Sir R. Craigie, 1945; Handbook of Japanese Grammar, H. G. Henderson, 1945; Key to Japan, W. Price, 1946; Japan, a short cultural history, G. B. Sansom, 1947.

Japan. SA OF. Arm of the Pacific Ocean. It lies between Japan on the E. and Korea and the Siberian Coast Prov. on the W. In the N. it communicates by the Gulf of Tartary with the Sea of Okhotsk, and in the S. the Strait of Korea leads to the East China Sea. The outlets to the Pacific on the E. are Soya Strait, between Sakhalin and Hokkaido; Tsugaru Strait, between Honshu and Hokkaido; and the Inland Sea, between Kyushu and Honshu. Length from N. to S. about 510 m.; width from E. to W. 600 m. Mostly shallow, not exceeding 500 ft., it is almost tideless.

Japanese Cypress (*Chamaecyparis obtusa*). Evergreen tree of the family Coniferae, a native of Japan. The trunk reaches a height between 70 ft. and 100 ft.; the branches are fan-like, closely covered with overlapping, scale-like leaves of a light green colour. The cones are round, the woody scales not overlapping, but "butting" at the edges all around.

Japan Medlar. Alternative name for loquat (*q.v.*), the fruit of *Photinia japonica*.

Japanning. Process of giving a hard glossy surface to wood, metal, or other material. Origin-

ally "Japan varnishes" were made with the object of imitating Japanese lacquer ware, the production of which involved totally different materials and methods. The distinguishing feature of japan finishes is a deep lustrous surface, whereas pigmented finishes reflect light from the surface only. The characteristic ingredient is a bituminous substance with which may be combined resins and drying oils, the composition depending upon the characteristics required and the method of application. Where high resistance to weather is required, a finishing coat of oil varnish is applied. Air-drying japans usually dry sufficiently hard for polishing within 24 hours. Stoving lacquers are largely used for domestic ironware, deed boxes, papier mâché, etc. Each coat is dried by stoving at temperatures from 130° to 300° F. and then rubbed down to ensure a perfectly smooth surface for the next application. The term japan driers is sometimes applied to a hard quick-drying preparation, containing resins and driers combined with linseed oil, sometimes added to paints. See Lacquer; Varnish.

Japheth. One of the sons of Noah, whose son Javan was the reputed ancestor of the Ionians (Gen. 10). The name Japhetic, now replaced by Aryan or Indo-European, was formerly used to designate the Caucasian peoples of Europe and parts of Asia, as contrasted with the Hamitic and Semitic.

Japonica. Species name applied by botanists to indicate that certain plants are natives of, or were first observed in, Japan. The word is in common use among gardeners, who generally mean by it *Pyrus japonica*, but it indicates as clearly species of *Kerria*, *Enkianthus*, *Skimmia*, or half a dozen other well-known genera.

Japurá. Alternative spelling of the river of S. America better known as the Yapurá (*q.v.*).

Jaques. Character in Shakespeare's comedy *As You Like It* (*q.v.*). A lover of music and a courtier of melancholic and almost pessimistic temperament, his philosophy is summed up in his discourse on the seven ages of man. Pron. Jay-kwez.

Jaques - Dalcroze, ÉMILE (b. 1865). A Swiss composer and teacher. Born at Vienna of Swiss parentage, July 6, 1865, he became professor of harmony at Geneva university in 1892. Impressed by the special value of

rhythmic motion, he collaborated with E. Clapride, a French psychologist, and evolved a system of movement and gesture. Failing to get this practice introduced at the Geneva conservatoire, he resigned his professorship, and in 1910 established near Dresden a school of eurhythmics. The system became popular, schools being established in various European centres. In 1913 the founder became head of an institute named after him at Geneva. A pupil of Bruckner and Delibes, his compositions included operas, *e.g.* *Sancho Panza*, 1897, and songs. See Eurhythmics.

Jarabub. Oasis in the Libyan desert, about 120 m. S. of Bardia, just within territory which became Italian in 1926. A religious college for Muslims was founded here in 1885 by the head of the Senussi sect of Arabs. Rosita Forbes visited the oasis in 1920. During the Second Great War Jarabub was captured from the Italians, May 21, 1941, after a stubborn defence lasting fifteen weeks. Not retaken in any Axis counter-offensive, it formed a base for operations by the Long Range Desert Group (*q.v.*).

Jardine, DOUGLAS ROBERT (b. 1900). English cricketer. The son of a former Middlesex player, he was born at Bombay, Oct. 23, 1900, and played for Winchester and Oxford before joining the Surrey team, of which he became captain in 1932. In Australia, 1928-29, he scored 341 runs in test matches. He captained England against New Zealand, 1931; against India, 1932; and then in Australia, 1932-33. This last tour was notable for Jardine's refusal to abandon the leg-theory bowling of Larwood, described by the Australians as body-line (*q.v.*) bowling. Jardine's command of cricket tactics was again evident during his captaincy of England against the West Indies and in India, but when the Australians arrived in 1934 he withdrew from international cricket.

Jargoon OR JARGON. A name applied to varieties of zircon, especially the colourless or smoky zircons from Ceylon, which resemble the diamond in lustre. Brown zircon may lose its colour on heating, giving a stone also resembling diamond. These deceptive stones are sometimes called Matura diamonds, after a place in Ceylon. See Zirconium.

Jarkent. Alternative spelling of the Central Asian city better known as Yarkand (*q.v.*).

Jarley, Mrs. A character in Dickens's novel *The Old Curiosity Shop* (*q.v.*). Proprietress of a travelling waxwork exhibition, she does her best to befriend Little Nell and her old grandfather in their wanderings.

Jarnac. Town of France, in the dept. of Charente, 7 m. E. of Cognac. The battle of Jarnac was fought March 13, 1569, during the religious wars in France. The Huguenot army, under Condé, was in the S.W., anxious to avoid an engagement with its pursuers, under the duke of Anjou, until it was strengthened by some German allies. On March 13, however, when moving N., part of it was caught by Anjou's lieutenant, Tavannes, near Jarnac. A hot fight followed. Condé and his men fought bravely, and then, seeing how hopeless their case was, they charged into the foe and died fighting. The phrase *coup de Jarnac* (a surprise hit) refers to the lucky stroke of the comte de Jarnac in his duel with Châteignerai in the 16th century.

Jarndyce v. Jarndyce. Fictitious Chancery suit in Dickens's novel *Bleak House* (*q.v.*). It was



Jarrah. Examples of this eucalyptus tree of Australia

meant to typify and satirise the inordinate length of time then taken by the court of Chancery over the settlement of such suits, regardless of the human tragedy that might thereby be involved; and it is still often quoted as a symbol of the law's delays. Legal disputing over the Jarndyce estate was so prolonged that when the case was eventually settled the entire estate was found to have been swallowed up by the costs.

Järnefelt, EDVARD ARMAS (b. 1869). A Finnish composer. Born at Viborg (Viipuri), Aug. 14, 1869, he was educated at Helsinki university and Paris and Berlin conservatoires. He conducted at the Stockholm royal theatre, 1907-32, and then became conductor and director of the Finnish opera. Of his compositions, light and cheerful, the best known is *Praeludium*, first performed in Great Britain in 1909. He also wrote songs.

Jaroslavl. Town in Poland, in Galicia, about 22 m. N.N.W. of Przemyśl. It is an important rly. junction, and manufactures textiles and earthenware. Pop. est. 25,000. Owing to its situation near the Moravian Gap between the Carpathians and the source of the Vistula, Jaroslavl was of strategic importance in both Great Wars. In 1914 it lay in Austrian territory, barring the way by which the Russians hoped to advance to Cracow and thence W. Following up their victories in S.E. Poland, the Russians reached Jaroslavl on Sept. 19 and captured it in two days against slight resistance. Austrian troops recovered it on Oct. 11, but lost it again on the 23rd. An Austro-German force finally took it on May 14, 1915. When Germany and Russia partitioned Poland in 1939, Jaroslavl was on the German side of the border, and one of the places whence they attacked Russia in 1941. Russian troops under Marshal Koniev captured it in their drive westwards, July, 28, 1944. It should not be confused with the Russian city and region of Yaroslavl (*q.v.*), sometimes spelt Jaroslavl(1).

Jarrah. Dark coloured, close-grained wood of *Eucalyptus marginata*. It is much like mahogany, very durable when kept dry. The tree is a native of Australia, and has a light-coloured bark, from which it is known as yellow jacket.

Jarrott, CHARLES (1875-1944). British motorist. Born March 26, 1875, and educated in London and at Cambridge, he won the first motor cycle race in England. He won the Circuit des Ardennes race in 1902, and accomplished the world's record for 50 m. in 1908. Author of *Ten Years of Motors and Motor Racing*, 1906, he became chairman of the Automobile Association. He died Jan. 4, 1944.

Jarrow. Mun. bor. of Durham, England, on the S. bank of the Tyne, between South Shields and Hebburn, with a rly. station. Its rapid growth in the 19th century

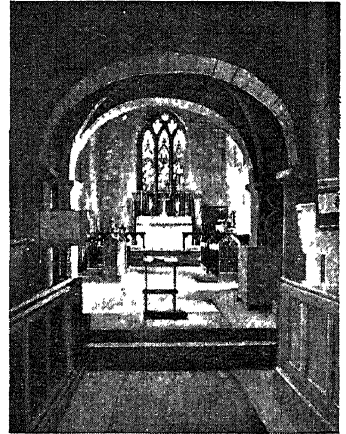
was due to the shipbuilding industry established by Sir C. M. Palmer, in connexion with which were iron foundries, engine works, rolling mills, etc. The decade 1930-40 was one of unemployment for up to 80 p.c. of the working people, the great Palmer works being closed down

in 1933. The town was then included in a special area where state encouragement was given to industry, and present occupations include steel rolling, manufacture of refined metal and tubes, ship repairing, asphalt preparation, and slag crushing.

The Tyne Tunnel Act, 1945, provided for three tunnels (for



Jarrow arms



Jarrow, Durham. Interior of the church of S. Paul, formerly part of the monastery where Bede lived and died

pedestrians, cyclists, and vehicles) under the Tyne between Jarrow and Howdon, to cost £3½ millions; the first two, completed 1947-50, cost £617,000. In the monastery at Jarrow, founded by Biscop in 681, now in ruins, the Venerable Bede spent most of his life and there died. The original dedication stone of S. Paul's (Bede's church) is well preserved and bears the date equivalent to April 23, 685. Jarrow gives its name to a co. constituency. Pop. est. 27,000.

Jarvie, NICOL. Character in Sir Walter Scott's novel *Rob Roy*. A bailie, he is as proud of his magisterial office as of his bawbees. His vanity is more than exceeded by his courage, sincerity, and kindness of heart.

Jasher OR JASHAR, THE BOOK OR. Lost collection of Hebrew heroic songs. It is twice quoted in the O.T., Josh. 10, vv. 12-13; and

2 Sam. 1, v. 18. In 1854 J. W. Donaldson issued in Latin a work entitled *Jashar* or *Fragments of Original Hebrew Songs* inserted in the Masoretic Text of the O.T. This attempted to reconstitute the book of Jasher from remains of old songs and historical records incorporated in the existing text of the O.T. See *Old Testament; consult Introduction to the Critical Study and Knowledge of the Holy Scriptures*, T. H. Horne, 1818; *Literary Remains*, E.O.M. Deutsch, 1874; Canon of the O.T., H.E. Ryle, 1892.

Jashpur. Area in the Madhya union, India. Its area is 1,955 sq. m., and its pop. 223,612. Among the crops are sugar cane and wheat. Formerly a state, it was ceded to the British government in 1818.

Jasmin (1798-1864). The provençal poet whose real name was Jacques Boé. Son of a tailor, he was born at Agen, March 6, 1798, and became a hair-dresser. A keen student of literature, he set out to revive the language and the literature of his native Gascony, publishing his first poem, *Me Cal Mouri*, in 1822. A collection of such verses, all racy of the Provençal soil, followed under the title of *Las Papillotes* in 1835, and in 1836 came *L'Abuglo de Castel-Cuillé* (the Blind Girl of Castel-Cuillé), later translated by Longfellow. Other series of *Las Papillotes* followed in 1851 and 1853. Among Jasmin's other most influential works were



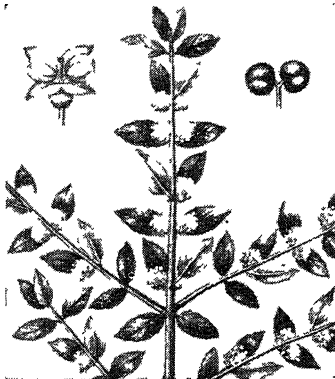
Jasmin, from the bronze statue at Agen

Françounetto, 1840, and *Maltro l'Innocento*, 1847. He died at Agen Oct. 4, 1864, the forerunner of Mistral in the revival of Provençal.

Jasmine OR **JESSAMINE** (Pers. *yasmin*). Group of hardy and exotic climbing and trailing plants of the family

Oleaceae, genus *Jasminum*. Of the hardy sorts the most popular is *J. officinale*, which bears white star-like flowers in summer and flourishes in any ordinary garden soil. *J. nudiflorum*, the yellow winter jasmine, is a valuable climbing plant for town gardens.

Jasmine Box OR **MOCK PRIVET** (*Phillyrea*). Small genus of evergreen shrubs of the family Olea-



Jasmine Box. Flowering branch, flower, and fruit of *Phillyrea latifolia*

ceae, natives of the Mediterranean region. They have opposite, oval or lance-shaped leaves, and small white or greenish-white flowers, in clusters. The fruits are round or egg-shaped, containing one or two seeds embedded in pulp. *P. angustifolia* has slender, *P. latifolia* oval, *P. intermedia* lance-shaped, and *P. vilmariniana* oval-lance-shaped leaves.

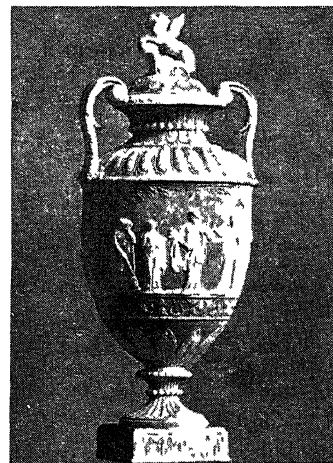
Jason. In Greek mythology, the leader of the Argonauts. He was the son of Aeson, king of Iolus in Thessaly, whose throne had been usurped by his brother Pelias. When Jason grew up to manhood, Pelias, to get rid of the rightful heir to the kingdom, persuaded him to organize an expedition to fetch the Golden Fleece from Colchis on the Black Sea.

On the return of Jason to Iolus after the expedition, he found that Pelias had murdered his father. To avenge the murder, Medea, Jason's wife, persuaded the daughters of Pelias to cut their father in pieces and boil him in a cauldron, assuring them that they would thereby renew his youth. Expelled for this deed, Jason and Medea then went to Corinth, where Jason deserted his wife for Creusa, daughter of Creon, the king. Medea avenged herself by sending Creusa a poisoned robe, which burned her to death, and by killing her children by Jason. See *Argonauts*; *Medea*.

Jasper (Arab. *yasb*, Gr. *iaspis*). An impure opaque form of mas-

sive, fine-grained silica. Usually red, brown, or yellow, it is beautifully banded in some varieties, e.g. Egyptian or ribbon jasper. Porcelain jasper is clay or shale that has been baked during the intrusion of a hot igneous rock. Jasper takes a high polish and is used as an ornamental stone. See *Gem*.

Jasper. Ware or form of porcelain invented by Josiah Wedgwood. It had a smooth, unglazed surface, of a uniform colour, on which were placed cameo-like embellishments in white. Wedgwood adopted Grecian forms for his



Jasper. Vase of blue and white jasper ware ornamented with reliefs representing the Muses Victoria and Albert Museum

decorations, copied from originals or designed by Flaxman and others. See *Porcelain*; *Wedgwood*.

Jasper, JOHN. A character in Dickens's unfinished novel *The Mystery of Edwin Drood*. Lay precentor of Cloisterham cathedral, he is portrayed nevertheless as a sinister figure, a secret opium addict, with some hypnotic powers, and a hint of Oriental extraction. So far as can be assumed from the published chapters and from external evidence, he murders his nephew Edwin Drood, probably by strangulation, burying the body in quicklime in one of the cathedral vaults. Some theorists have surmised that he was a devotee of Thuggee, practising ritual murder. See *Drood Controversy*.

Jasper National Park. Largest mountain playground in N. America. It occupies 4,200 sq. m. in the heart of the Rocky Mts. on the W. border of Alberta, Canada. Set aside as a national park by the Canadian government in 1907, it has not only a wealth of beauty in mountain, forest, valley, lake and



Jasmine. Leaves and flowers of *J. officinale*



Jasper National Park. In this view of part of the extensive Canadian playground in Alberta, the Continental Limited is seen passing through the park, and the Athabasca river winds its course to accentuate the beauty of the Rocky Mountains scenery
Canadian National Railways

stream, but also a great sanctuary of wild life. The two centres of pop. are the village of Jasper and Jasper Park Lodge, a C.N.R. guest house. Among the attractions are Mt. Edith Cavell (11,033 ft.); the Columbia icefield (110 sq. m.); Maligne Canyon; and Miette Hot Springs, with therapeutic waters gushing from the rock at 126° F.

Jassy, YASSY, or IASI. City of Rumania, formerly the capital of Moldavia. Situated on a small tributary of the Prut, it is about 200 miles N.N.E. of Bukarest, with which it is connected by rly., as also with Kishinev and Odessa. The centre of a trade in cereals, petroleum, salt, and cattle, it has a university, and is the seat of an Orthodox Church metropolitan and an R.C. bishop. By a treaty signed here in 1792 a war between Russians and Turks was ended. In 1821 Alexander Ypsilanti here raised the standard of Greek independence against Turkey. During the First Great War Jassy was for two years the seat of the Rumanian government after the evacuation of Bukarest in Dec., 1916. Troops of the Russian army took it from the Germans on Aug. 22, 1944 (see Russo-German campaigns). Jassy is also the name of a district with an area of 1,210 sq. m. Pop., est. 108,907. It is the cultural capital of Rumania.

Jász. Term common to numerous place-names in Hungary. It is derived from *Jászág*, the Magyar name for the land of the *jászok* (jazyges) or bowmen. Like the Kumanians, the *jászok* were immigrants from the east into the Alföld, where they settled between the Tisza and the Danube and were Magyarised. Their joint territory is now represented by the Hungarian county, *Jász-Nagy-*

Kun-Szolnok, where the term Nagy-Kunmeans Great Kumania.

The modern county lies both sides of the Tisza, and has an area of 3,280 sq. m. and a pop. of 374,000, 96 p.c. of whom are Magyars. In the N.E. and in the adjacent county of Hajdu is the Hortobágy Puszta, more than 300 sq. m. in area, noted for fine herds of cattle and horses. In the

S.E. is the lower valley of the three-fold Körös—Black, Swift, and White. The chief towns are Mezötur, Szolnok, Karczag, and Jászberény. The last stands on the Zagyva, a right bank tributary of the Tisza, and is 60 m. by rly. E. of Budapest. A typical Alföld garden city, Jász has a prosperous market in corn, horses, and cattle.

Jat. People in N.W. India and Pakistan, especially in the Punjab, in the Uttar union, and in Sind. Numbering roughly 8,000,000, they are usually tall, light-brown, straight-nosed, bearded longheads, devoted to agriculture and cattle-breeding. Distinguishable from the Rajputs mostly by social inferiority and widow remarriage, their thousand tribes profess the Brahman, Sikh, or Muslim faiths. Immigrant from central Asia with some Scythic traits derived from their Altaian overlords, they are no longer identified with the ancient Getae. Their Indo-Aryan speech is called Jatki. Formerly they were a military power.

Játaka. Legends of the successive births of the Buddha. They were translated by T. W. Rhys Davids, 7 vols., 1877–91, and again under the editorship of E. B. Cowell, 1895–1907. See Buddhism.

Játiva. City of Spain. In the prov. of Valencia, it is the ancient Saetabis. It stands on the Albaida river, 35 m. by rly. S. of Valencia. Picturesquely placed on the slope of a hill, it still retains much of its Moorish aspect. The former cathedral, dating from 1414, is one of many churches and convents. The seat of a Visigothic bishop from 483 to 711, the city was taken by the Moors, but was recaptured by James I of Aragon in 1244. It was long famous for its fine linens. Pop. 17,800.

Jauer (Pol. Jawor). A town in Silesia, under Polish administration from 1945. Once the capital of a small principality (1314–92), then Bohemian, it was taken by Frederick the Great for Prussia. Remnants of the old town include a Gothic church (S. Martin's), and the Peace Church, 1656. Situated 10 m. S.S.E. of Liegnitz, on the Wütende Neisse, Jauer was famous for sausages.

The gradual decline of its medieval linen industry left it with wood, engineering, and cigar industries, and it was also a centre of sugar beet cultivation. Pop., pre-war, 13,191. Pron. Yow-cr.

Jauf. A town of Nejd, Saudi Arabia. Situated in the great oasis-depression of Jauf-Sakaka, the town has extensive palm groves and is connected by motor road with towns on the N. frontier. It occupies the site of the original settlement of Daumat-al-Jandal, its chief feature being the fine medieval castle of Marid. Pop. over 10,000.

Jaundice (Fr. *jaunisse*, yellowness). Symptom which arises in the course of many diseases of the liver. The commonest cause is obstruction of the bile duct, through which the bile passes into the duodenum. If this becomes obstructed by inflammation, tumour, or gall-stone, the bile is held up in the liver, and is forced into the circulation. Jaundice may also arise from the toxins of certain diseases, such as yellow fever, malaria, and typhus, and from poisons, such as phosphorus. The most dangerous cause is a streptococcal attack on the substance of the liver itself.

The earliest sign is the yellow tinting seen in the whites of the eyes and on the under side of the tongue. As the condition progresses the whole skin changes from a lemon yellow to a deep olive green in colour. This may be associated with severe and distressing itching, caused by the chemical irritation of the cutaneous nerve endings. Treatment is to give warmth, fruit and vegetable juices, free fluid with glucose, and vitamin D.

Jaunpur. A district, subdivision, and town, Benares division, United Provinces, India. Its area is 1,555 sq. m. Two-thirds is under cultivation, barley and rice being the chief crops. The industries include sugar refining. Sugar and grain are exported and piece goods and salt imported. Pop. district, 1,387,439; subdivision, 310,282; town, 44,833.

Jaunting Car. An open horse-drawn vehicle once common in Ireland, and still seen *e.g.* at Killarney. The passengers, including the driver, sit back to back on seats over the two high wheels. Usually four persons can be carried, two on each side, and the lightness of structure allows of considerable speed. The drivers plying for public hire are known as jarveys. *See* Carriage.

Jauregg, JULIUS WAGNER VON (1857-1940). Austrian pathologist, born March 7, 1857, at Wels, Upper Austria. He became assistant professor for nervous and brain diseases at Graz university in 1889, after having begun to experiment with "healing fever" treatment of paralysis. By 1917 he had found a cure for progressive paralysis of syphilitic origin, infecting patients with the counterpoison of malaria. He had been made professor at Vienna university in 1893; in 1927 he was awarded the Nobel prize for medicine, and next year he retired. He was an authority on thyroid diseases, heredity, and forensic medicine. Among many publications his *Manual on Organo-Therapeutics*, 1914, stands out. His influence as a teacher was international. *Pron.* Yow-reg.

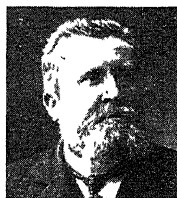
Jaurès, JEAN LÉON (1859-1914). French Socialist. Born at Castres, Sept. 3, 1859, he was educated there and in Paris. From 1883 he was lecturer in philosophy at Toulouse university until elected deputy in 1885. For many years he represented the miners of Carmaux in the chamber. Jaurès joined the Socialist party in 1893, and was its chief orator and parliamentary leader.

He also joined the staff of *La Petite République*, but left it in 1904 and founded *L'Humanité*. He played a prominent part in the movement for a new trial of

Dreyfus; advocated a collectivist programme; at all the leading international Socialist conferences his ideas and speeches carried weight.

But his action as an apostle of international peace and the reduction of armaments aroused animosity, and led to his assassination on July 31, 1914, by a youth, Raoul Villain, who was tried and acquitted in 1919.

Jaurès' published works include: *L'Action Socialiste*; *L'Histoire Socialiste*; *Idéalisme et Matérialisme dans la Conception de l'Histoire* (with Paul Lafargue); *L'Action du Parti Socialiste au Parlement et dans le Pays* (with R. Viviani, E. Milhaud, and A. Briand); *L'Internationalisme à la Chambre*; *L'Internationalisme et la Patrie*.



Jean Jaurès,
French Socialist

is indented by numerous bays, which afford sheltered harbours, the chief of them being Jakarta (the former Batavia) and Surabaya; another is at Tjilatjap on the S. There are several headlands, including Cape Sedano, Java Head, and Cape St. Nicholas. Rivers are numerous, flowing either N. or S. to the sea; navigable are the Tjitaroem, Solo, Kediri, and Tjitmanoeck, useful only for light craft a short distance from their mouths. The loftiest summits occur in the E., where Semeru rises to an alt. of over 12,000 ft., the culminating point on the island. In the W. is the volcano Galunggung, active in Oct., 1822, when 4,000 people perished and 114 villages were destroyed.

Lignite, asphalt, naphtha, tin, and salt exist in large quantities, and there are extensive forests of oak, coconut, rubber, pine, chestnut, and upas trees. The animals include the tiger, leopard, rhinoceros, civet, deer, lemur, wild dog, wild ox, buffalo, and several



Java. Map of this island of Indonesia, third largest of the Sunda group

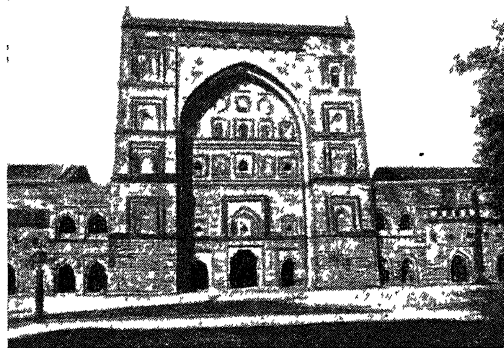
Java. An island of Indonesia. It is the third largest of the Sunda group, ranking after Borneo and Sumatra. It is separated from Borneo by the Java Sea; from Sumatra on the W. by the Strait of Sunda; from the island of Bali on the E. by Bali Strait. Its extreme length is about 632 m., its breadth varying from 35 m. to 121 m. Area, including the island of Madura, 51,032 square miles.

Java is low-lying and covered with mangrove swamps on the N. The interior is wholly mountainous, with many active and extinct volcanoes, ranging between 6,000 ft. and 9,000 ft. The S. coast is bold and rugged, but the N. coast

species of monkey. Among the birds are jungle fowl, peacocks, doves, pigeons, etc.

Large areas are under rice, the staple crop, but tea, coffee, cocoa, sugar, maize, cassava, soya beans, groundnuts, tobacco, rubber, indigo, pepper, and cinchona are cultivated. The principal exports include rice, copra, tobacco, tea, coffee, sugar, tin, teak, hides, and tapioca, and the trade is mainly in the hands of the Dutch and Chinese. Under Dutch administration all creeds were tolerated. The large majority of the inhabitants are Mahomedans, Buddhists, or animists. Population, with Madura, 41,718,364.

Before the landing of the Portuguese in the early part of the 16th century Java had been the seat of powerful Hindu princes. In the 16th century the Portuguese were ousted by the Dutch. In 1602 the latter established their East India company, which was dissolved in 1799. Occupied by



Jaunpur, India. Main entrance of the Jama Masjid mosque, built 1438-78. *See* page 4662

the British 1811-16, Java was otherwise under Dutch rule until 1942.

In the Second Great War, Gen. Wavell, appointed Allied c.-in.-c. in the S.W. Pacific Jan. 3, 1942, made his h.q. at Bandoeng, Java. From Feb. 3, the island was bombed almost daily by the Japanese until they landed early on Feb. 28 at Bantam, 50 m. W. of Batavia, Indramayu 100 m. E. of it, and 20 m. E. of Rembang. From E. and W. they closed on Batavia, which fell March 5. Wavell returned to India March 2, and the Allies, outnumbered eight to one, fought desperately to hold the approaches to Bandoeng. That town and Surabaya naval base were captured on March 8. Java remained in Japanese hands until Sept., 1945; for subsequent political events, see under Indonesia.

Java has yielded fossil bones of the earliest known anthropoid exhibiting the erect posture of man. Prehistoric occupation by primitive Indonesian animists is attested by Stone Age remains. See Asia.

Java Sea. Part of the Pacific Ocean. It lies between Borneo on the N., Java on the S., Sumatra on the W., and the island of Celebes and the Sunda or Flores Sea on the E. The Carimata Strait, on the N.W., leads to the China Sea; the Strait of Macassar on the N.E. to the Celebes Sea; while the straits of Lombok Bali and Sunda give access to the Indian Ocean.

Java Sea, BATTLE OF. Naval engagement of the Second Great War. After the battle of the Bali Straits (*q.v.*), Feb., 1942, which had denied Bali to the Japanese as a base for the invasion of Java, it was learned that two more enemy fleets were on their way to attempt a landing. Although either of the Japanese forces was superior to the Allies, Adm. Helfrich, c.-in.-c. of the British, Dutch, and U.S. naval forces in the S.W. Pacific, determined to seek out one or other and give battle. He hoped to manoeuvre the enemy ships into such a position that they would be compelled to fight a night action similar to that which had defeated them at Bali. While involving risk to irreplaceable warships, the Allied plan had certain advantages. If the Japanese could be brought to battle before, or just after, they had begun landing troops, they would be severely handicapped. The defending warships would be close to the transports, unable to intercept or attack before the Allied squadron reached the convoy.

On the afternoon of Feb. 27, Rear-Adm. Doorman, in operational command of the Allied squadron, received a message that an enemy convoy was lying W. of the island of Bawean, some 60 m. N. of Surabaya. Doorman's force consisted of five cruisers, Java and De Ruyter (Dutch), Houston (U.S.), H.M.S. Exeter, and H.M.A.S. Perth, and nine destroyers, three British, four American, and two Dutch. The cruisers were all modern vessels, although the Houston had only two-thirds of her main armament available; the destroyers were older, less efficient, and most of them in need of overhaul. Taking a N.E. course, Doorman hoped to come up with the Japanese convoy while the warships were protecting the disembarkation. Air reconnaissance, however, had kept the enemy fully informed of the Allied move, and the Japanese commander sent his transports N. and concentrated his warships on a S.E. course.

At 4.10 p.m. the British destroyers made contact with the enemy force which was found to consist of four cruisers and 12 destroyers. Fire opened at a range of 10 m., but conditions were unequal, for the enemy vessels mounted 8-in. guns, to which only the Exeter and Houston, having equivalent armament, could make effective reply. After one Japanese cruiser had been hit, the enemy laid a smoke screen and contact was momentarily lost. However, the action was resumed 20 minutes later at reduced range, which enabled the other Allied cruisers to take part. Almost immediately the De Ruyter and Java received direct hits, which did not seriously disable them. The Allied squadron then came under concentrated fire, as a result of which the Exeter was hit, and was compelled to drop out of line. The Dutch destroyer Kortenaer was then torpedoed and sank. Doorman detached the other Dutch destroyer to escort the Exeter back to Surabaya, and the Allied ships again formed up to engage the enemy. Destroyers made contact at close range, and in a confused engagement two of the Japanese destroyers and H.M.S. Electra were lost. The enemy followed up with a destroyer attack and managed to sink H.M.S. Jupiter for the loss of one ship.

At sunset Doorman broke off action to take stock of the situation. It had not been his intention

to maintain battle with naval units, but to slip past the warships and attack the transports. This he now decided to do, although his force had dwindled to four cruisers; his destroyers were short of fuel and had fired all their torpedoes, so that they were unable to accompany him on his westward sweep. The weather was particularly unfavourable as a full moon made visibility almost as clear as in daylight. Enemy reconnaissance aircraft maintained constant watch over the Allied cruisers.

Shortly after 11 p.m. contact was made with four enemy cruisers of the Moyami class. Fire was opened at 5 m. and the De Ruyter was hit several times. The Japanese then decreased the range and launched a torpedo attack which sank both Dutch cruisers. In face of a greatly superior enemy, and impelled by the necessity of not sacrificing the only two cruisers remaining for the defence of Java, the Perth and the Houston broke off the fight and made for Tanjong Priok; but the way through Sunda Strait was blocked by a strong force of cruisers, and both ships were eventually lost while trying to break through into the Indian Ocean. The four American destroyers were the only Allied ships to survive the engagement; by the eastern approach, not navigable for larger vessels, they got through Bali Strait into the Indian Ocean. The Exeter, which had put into Surabaya for temporary repairs, also attempted to escape into the Indian Ocean, but, sailing at reduced speed, and accompanied only by the British destroyer, Encounter, was caught some distance from Surabaya and sunk with her escort. The Java Sea came entirely under Japanese control, and on the morning following the Allied naval disaster, the enemy landed at three points on the N. coast of Java. This battle was to be the final offensive effort of the United Nations in the S.W. Pacific for a long time. It was a cheap victory for the enemy, with one cruiser and three destroyers sunk, and other vessels damaged.

David Le Roi

Javelin, JAVELING, OR JAVELOT. Short, light spear, which can be thrown at its target. The javelin has been used, both in war and in hunting, at many periods of history. As used for military purposes in classical times, its

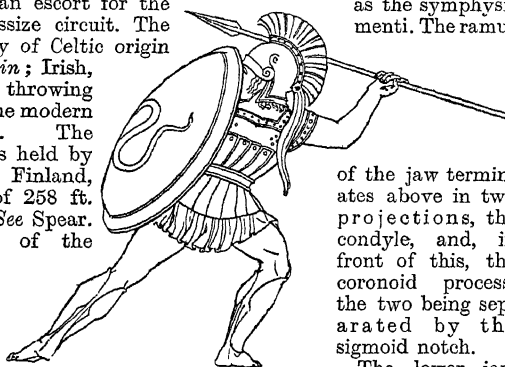
estimated range was from 30 to 40 yards. In England, javelinmen were formerly provided by the sheriffs as an escort for the judges on an assize circuit. The word is probably of Celtic origin (cf. Breton, *gavlin*; Irish, *gabhal*). Javelin throwing was revived in the modern Olympic games.

The world's record is held by Y. Nikkanen, Finland, with a throw of 258 ft. 2½ ins., 1938. See Spear.

Jaw. Bones of the mouth containing the teeth. The upper jaw is formed by the margins of the two superior maxilla bones, which constitute the principal bones of the face. They lie beneath the cheeks and form part of the orbits and the larger part of the nose. The bony structure into which the teeth are inserted is termed the alveolar margin. The lower jaw is formed by the two inferior maxilla bones, which are united in the chin in front. At the back, the lower jaw articulates on each side with a cavity, the glenoid fossa of the temporal bone. The jaw-bone is roughly shaped like an L, the vertical part being known as the ramus, and the horizontal part as the body, the point where the two parts meet forming the angle of the jaw.

The superior border of the body is known as the alveolar margin, and contains the sockets for the teeth. The mental foramen, or opening through which the mental

tubercle, which forms the chin, the union in the middle line of the two halves of the jaw being known as the symphysis menti. The ramus



Javelin. Greek soldier about to throw his javelin

Hope's Costumes of the Ancients

of the jaw terminates above in two projections, the condyle, and, in front of this, the coronoid process, the two being separated by the sigmoid notch.

The lower jaw affords great assistance in determining the age of a skeleton. In infancy the angle of the jaw is obtuse, and may be as much as 140°. As life progresses it becomes smaller, and in adults is a little more than a right angle. In old age the angle becomes obtuse. In the toothless jaw of old age the alveolar margin becomes largely absorbed, and the mental foramen, instead of being about midway between two borders, is close to the upper border. The inner surface of the chin serves for the attachment of various muscles used in speech. In the child enlarged adenoids may spoil the structure and line of the jaw by interfering with respiration, so surgical help must be sought.

Dislocation of the lower jaw, not a frequent accident, may result from a blow on the chin, or may be due to excessive stretching of the mouth, as in yawning or taking a large bite. The mouth is fixed widely open, with saliva dripping from it, and speech and swallowing are interfered with. Reduction can usually be effected without difficulty. One stands in front of the patient and, having covered the thumbs with thick cloths, places them in the mouth and presses firmly in a downward and backward direction until the articulating condyle is free. The chin is then raised with the fingers, and the jaw slips back into position.

The lower jaw may be fractured by a fall or a blow on the chin, the fracture most usually occurring near the mental foramen, the weakest part of the bone. The fracture may also occur across the angle of the bone, or the condyle or tip of the coronoid process may be broken off. The fragments should be set and maintained in their

proper position by suitable splints. See Anatomy; Dentistry; Head; Man; Phossy Jaw; Teeth.

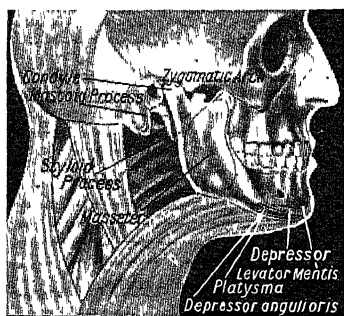
Jay (*Corvus*). Genus of birds of the crow family, Corvidae, natives of Europe, Asia, Africa, and N. America. The typical species is the common jay (*G. glandarius*) of British woodlands and the greater part of Europe. About the size of a jackdaw, it is one of the most handsome of native birds, its general colour being cinnamon with a grey crest streaked with black, black bill and moustache, and a white throat. On the wing coverts there is a large patch of brilliant blue, barred with black.

An omnivorous feeder, the jay destroys insects and snails in the winter and spring, in addition to garden fruit if it is adjoining his copse. The cup-shaped nest, constructed of twigs and roots, is placed in a tree or bush, and contains from three to seven eggs of a greenish tint closely dotted with brown. Gamekeepers wage war on the jay because of its depredations on the eggs and young of the pheasant, and long rows of victims may be seen on any keeper's gibbet. It is frequently stated to be becoming rare, but this is far from truth. Under the Protection of Birds Act, 1933, it is an offence to capture a jay with the object of selling it alive, e.g. so that it may be kept in captivity. The blue jay (*G. cristatus*) of N. America is similar in form and habits, but its colour is blue-purple, with black-barred bright blue on the wings and tail.

Jay, JOHN (1745-1829). American statesman. Born in New York, Dec. 12, 1745, the son of a rich merchant, he was there educated, and became a barrister in 1768. He entered public life as secretary of a commission appointed to settle the boundary between New York and Connecticut. In the troubles between Great Britain and her colonies, Jay was prominent, though not an extremist. He was a member of both colonial congresses, and also of



Jay. Common jay, *G. glandarius*



Jaw. Bones and muscles of the human jaw

(Lat. *mentum*, chin) nerve and vessels pass to supply the chin, lies about midway between the upper and lower margins of the bone, and approximately beneath the bicuspid teeth. In front, the body terminates in a projection known as the mental



John Jay, American statesman

between New York and Connecticut. In the troubles between Great Britain and her colonies, Jay was prominent, though not an extremist. He was a member of both colonial congresses, and also of

those of New York; and had much to do with drawing up declarations and appeals, as well as the constitution of New York state. He was chief justice of his state 1777-79, part of which time he was also president of congress.

In 1779 Jay was sent to Spain as minister, but his position was not recognized by the Spanish government, and he went to Paris in 1782 to assist Franklin and Adams in concluding the treaty of 1785 with Great Britain. Secretary for foreign affairs, 1784-90, he ably assisted Hamilton by writing in *The Federalist* and persuading the states to accept the amended con-

stitution. When this came into force Jay became chief justice of the supreme court until 1795.

Sent on a special mission to London, in 1794 he arranged a treaty, known as Jay's Treaty, that settled many of the points in dispute. This involved him in unpopularity with the anti-British party in the U.S.A., which passed away as the advantages of the settlement became better known. From 1795 he was governor of New York state, and from 1801, when his governorship ended, until his death, May 17, 1829, he lived in retirement. A Life by his son William Jay (1789-1858) appeared in 1833.

JAZZ: A FORM OF FOLK MUSIC

Rex Harris, Author of *The Story of Jazz*

Here is a serious study of a particular type of negro music, developed in the U.S.A. from origins reaching back into primitive Africa, which has fascinated white as well as black. See also Blues; Folk-Song; Spirituals, etc.

In its pure form jazz is folk music, the roots of which go back to the 20 Africans landed in America as slaves by a Dutch man-of-war in 1619 and to the millions imported during the subsequent 200 years. They took with them the poly-rhythmic subtleties of their many drum languages, which they grafted on to the white man's music, at the same time introducing their peculiar use of vibrato in singing to provide niceties of expression. This in time was translated into their instrumental music, producing sometimes tremolos of up to half-tone range. Their unfamiliarity with harmony led them to create a new scale—the diatonic major with added minor thirds and sevenths, now known as the "blues" scale, and this became the foundation of the Afro-American music that developed into jazz.

Hymn Tunes Adapted

Negro slaves took Methodist and Wesleyan hymn tunes and adapted them to their own idiom, building around a couple of lines their syncopated structure in which the accent was shifted from the strong to the weak beat, while their natural musical tradition called for *glissandi* and *portamenti* in the ever-varying melodic line. From this seed sprang spirituals, camp meeting songs, ring shouts, and revival songs, all in turn incorporated in the complicated jazz idiom.

Work songs lightened the burden of monotonous labour and (in present-day jargon) speeded up production, and were naturally welcomed and encouraged by

white overseers. These songs started life in the plantations and chain gangs; they were intensely rhythmical and made use of a recurrent beat that stressed the regular phase in the actual work being done; and it was mainly from these that the songs of misery, joy, love, despair, jealousy, and hope developed, forming the essence of jazz, the blues (*q.v.*).

Ragtime Introduction

Ragtime, the immediate forerunner of jazz, originated in the attempts of negro pianists of New Orleans to copy the brass bands' trick of shifting the accent from strong to weak beats when playing march tunes. Although the white man had imitated certain negro melodies as early as 1799, when the German singer Johann Graupner appeared in a Boston theatre with blackened face and started the minstrel cult, it was the peculiar inflections of the negro's vocalisation that created ragtime out of minstrelsy. Ragtime is syncopated music in common time, where the rhythm is suspended jerkily while the time flows on steadily: it is an uneasy movement from bar to bar which produces an element of musical surprise. It was one of the influencing factors on jazz, but the two ran parallel until ragtime died out after the First Great War.

Thus jazz arose from songs of the chain gang, from plantations, docks, and cotton fields, and this escapist music became superimposed upon the alien religious tunes the negroes heard. By 1900 they had gained a certain prosperity and freedom in New

Orleans—a "boom" town which was working and playing hard. A great mixed population sang for the love of singing, and through all this song was working the yeast of many African cultures. Piemen walked the streets singing the blues, and coalmen drove their carts, chanting mournfully. Street parades were common, brass bands marching and vying with each other in performance. These bands were later drawn in decorated wagons, and the instrumentation of the naturally small groups of players set the style for New Orleans jazz which persists (with the piano added), to the present day: cornet, clarinet, trombone, drums, and tuba, with the later addition of banjo or guitar, and string bass replacing tuba.

Functions of the Instruments

The functions of these instruments in jazz are to produce collectively improvised counterpoint in the following manner: the cornet (or trumpet) should play a relatively simple lead on the beat; the clarinet has a more complicated function consisting of agile runs which fill out the harmony and counterpoint; the trombone also fills out, but in addition gives a rhythmic drive by the dexterous use of *glissandi*; the piano is a rhythm/harmony instrument; banjo or guitar gives a simple straightforward on-beat rhythm; drums emphasise the off-beats (*i.e.* 2 and 4); and tuba or string bass, strictly on the beat, provides a basic structure by using the basic note of each chord.

The composer plays little or no part in jazz, the performers actually creating their music around prearranged series of chord sequences, collectively improvising on a known melodic theme—a polyphony to which is added the subtleties of polyrhythms. Although jazz has a fixed tempo which is in 4/4 time (occasionally 6/8), its rhythmic characteristics show many rich complexities of accents and stresses which produce exciting and stimulating suspensions and resolutions, these being built up in the melodic line and by the rhythm section.

This music made its influence felt around the turn of the century and was copied by white musicians who in turn made their contribution to the shaping of early jazz. Jack Laine and his Ragtime Band were the first white pioneers, introducing to New Orleans "new" music more acceptable than the vital crude intensity of the coloured people's jazz. This band

formed the basis of Tom Brown's Band from Dixieland, which later became the Dixieland Five and subsequently the Original Dixieland Jazz Band. This music was carried to St. Louis and Chicago by isolated groups in 1910-11. But for three factors, it might have remained localised in and around the Mississippi delta.

One factor in the spread was the missionary spirit of musicians travelling N. in the famous river boats. The second was an economic exodus from the S. due to the unemployment in the cotton fields caused by the boll weevil scourge: between 1910 and 1920 half a million whites and 50,000 negroes went up the river. The third was also economic, arising out of social conditions: jazz was intimately linked with the dives and the sporting parlours of New Orleans; when police action was taken hundreds of musicians lost the place where they could meet for a jam session (*q.v.*).

End of the Craze in Chicago

Chicago became the centre for jazzmen, and this ultimately proved the end of jazz *qua* jazz. The period of gangsters and speak-easies called for fast, exciting, loud music in which less attention was paid to quality. Soon, apart from some individual artists, jazz became a race in money-grabbing. Small groups of white enthusiasts, notably the Wolverines and the New Orleans Rhythm Kings, banded together to carry on the traditions of true New Orleans jazz, but they fought a losing battle.

Larger bands needed orchestrations or "arrangements" which stifled the creative impulse of many fine jazzmen drawn into the vortex from economic necessity. The Wall Street crash of 1929 spelt disaster to the few remaining small "hot" groups. Big combines organized a "sweet" escapist music for the period of depression; and when exciting music was wanted again a campaign popularised the word "swing." Effects were striven for just for the sake of novelty.

Jazz is a creative music which springs involuntarily from musicians playing primarily for their own satisfaction; while swing is an orchestrated, sophisticated offshoot of jazz, performed mainly as a means to a livelihood. True jazz was not often heard in the 1940s. It may die in the same way as folk music of other countries has died. But the gramophone was contemporary with its final flowering, and future

generations will be able to hear those who led the way in an art which arose from the despairs and triumphs of an enslaved people. They will be able to judge without prejudice its sincerity, its crudity, its warmth, and, above all, its vitality.

Jean Bart. French battleship. Named after the 17th century admiral (*see* Bart, Jean), she was completed in 1940. Displacing 35,000 tons on a length of 794 ft. and a beam of 108 ft., she had geared turbines of 155,000 h.p. to give a maximum speed of 30 knots. A main battery of eight 15-in. guns and a secondary battery of nine 6-in. were supported by 128 A.A. weapons. In June, 1940, the ship was sent to Casablanca where, offering resistance during the Allied landing there in Nov., 1942, she was severely bombed and put out of action. She later became a training ship for Fighting French naval forces and at the end of the Second Great War was sent to France for repairs.

Jeans, Sir James Hopwood (1877-1946). A British scientist. Born at Southport, Sept. 11, 1877,



Sir James Jeans,
British scientist

he was educated at Trinity, Cambridge, where in 1904 he was lecturer in mathematics. He occupied the chair of applied mathematics at Princeton, 1905-09, and was Stokes lecturer in the same subject at Cambridge, 1910-12. Secretary of the Royal Society, 1919-29, he was made research associate at Mt. Wilson observatory, U.S.A., in 1923. From 1935 he was professor of astronomy at the Royal Institution. Elected F.R.S., he was knighted in 1928, and received the O.M. in 1939. He died at Dorking, Sept. 16, 1946.

By early work on cosmic evolution, radiation, and the quantum theory, Jeans proved himself one of the most forceful thinkers of his age. His tidal theory of planetary creation, announced in *Problems of Cosmogony and Stellar Dynamics*, 1919, rapidly won acceptance. *Atomicity and Quanta*, 1926, was a brilliant contribution to the study of higher physics, and *Astronomy and Cosmogony*, 1928, further enhanced his reputation. *Eos*, 1928, and *The Universe Around Us*, 1929, introduced Jeans to the lay reader. His witty style and lucidity in dealing with ab-

struse problems created for him a wide public. Later books included *The Mysterious Universe*, 1930; *The Stars in their Courses*, 1931; *The New Background of Science*, 1933; *Through Space and Time*, 1934; *Physics and Philosophy*, 1942. In these he suggested that the universe might be a thought in the mind of a mathematician.

Jebb, Sir Richard Claverhouse (1841-1905). A British scholar. Born at Dundee, Aug. 27,



Sir Richard Jebb,
British scholar
Window & Grove

1841, the son of a barrister, he was educated at Charterhouse and Trinity College, Cambridge, where he became senior classic and a fellow. He remained teaching at Cambridge until 1875, for the last six years being also public orator, and then was chosen professor of Greek at Glasgow. In 1889 he returned to Cambridge as regius professor of Greek, and there remained until his death, Dec. 9 or 10, 1905. He was Unionist M.P. for the university, 1891-1905, was made a knight in 1900, and received the O.M. in 1905.

Gifted with an extraordinary memory and possessing an unusual gift for languages, Jebb was one of the greatest scholars of his time, a true successor of the humanists of the past. His edition of Sophocles, with notes and a translation, is generally considered his supreme contribution to classical scholarship. Other works include *The Attic Orators*, 1876-80; *Primer of Greek Literature*, 1877; *Introduction to Homer*, 1887. He wrote *A Life of Bentley*, 1882, and *Modern Greece*, 1901.

Jebel Druze. Another name for the Hauran mts. in Syria, the home of the Druses (*q.v.*). It is also the name of a region of the Syrian republic, incorporated 1942, just N. of the border, with Transjordan and about 60 m. E. of Lake Tiberias. The mts. of the region are bare and inhospitable, but the valley to the W. in which Suweida lies is comparatively fertile. The capital is Suweida. There was fighting in the Jebel Druze during hostilities between the Allies and Vichy France in 1941. A number of Druze cavalry rallied to the former, but Suweida held out until the cease-fire. Pop. 80,128.

Jebel Mansour. Mountainous country at the head of the Robaa valley in Tunisia, S.W. of Pont du

Fahs. Captured by the Germans in Jan., 1943, it was retaken on April 24 by the 19th French Corps after bitter fighting. See North Africa Campaign.

Jebel Shammar OR SHIMMAR. District of Nejd, Arabia. Lying S. of the great Nefud desert and partly included therein, it is a little known region with indefinite boundaries. Its capital is Hail. Pop. est. 150,000.

Jedabia OR AGEDABIA. Locality in Libya, near the coast, about 100 m. S. of Benghazi. Jedabia was the scene of heavy fighting between British and Italo-German forces during the N. Africa campaigns of the Second Great War, and was first captured from the Italians in Feb., 1941. In April the British withdrew before the advance of Rommel. In 1942 Jedabia was occupied by the 8th Army for nine days, from Jan. 13, before the last German offensive in Libya. On Nov. 23 it was seized and held by the British 8th army.

Jedburgh. Royal and police burgh of Roxburghshire, Scotland, also the co. town. It stands on the Jed, 56 m. S.E. of Edinburgh, and has a railway station. The chief buildings are the modern parish church, grammar school, public hall, county buildings, and



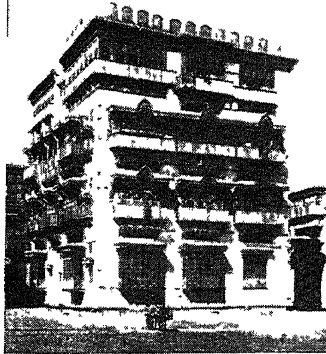
Jedburgh arms

prison, now turned to civil purposes. There are interesting old houses, including those once occupied by Mary Queen of Scots, Prince Charlie, and Burns, who was made a burghess of Jedburgh in 1787. Industries are the manufacture of tweeds and woollen goods, spinning, and tanning.

Jedburgh is one of the most interesting of Scottish burghs. The original town was about 4 m. to the S. of the present one. Its position near the border made it a frequent target for English attacks, and it had a castle, pulled down in 1409, in which the kings of the Scots sometimes lived. The name, sometimes spelled Jeddart or Jethart, is commemorated by the Jethart axe, a terrible weapon in the hands of the burghers, and by Jethart justice, i.e. hanging a man first and trying him afterwards (see Lidford). Jedburgh Abbey is one of the finest ruins in Scotland. It was founded in the 12th century for Augustinian monks. The house was dissolved in 1559. Later the ruins passed to the marquess of Lothian, whose ancestors, the Kers

of Fernherst, are buried in the N. transept. Taken over by the office of works, the ruins have been strengthened and carefully restored. Market day, Tues. Pop. 3,057. See Abbey.

Jeddah, OR JIDDA. Seaport of Arabia. It stands on the E. side of the Red Sea, in the Hejaz, about



Jeddah, Arabia. Lodging house, of which there are many in this seaport town, for the wealthier type of pilgrim on the way to Mecca

65 m. W. of Mecca. It played an important part in connexion with pilgrimage to Mecca. With the building of the Hejaz rly., Jeddah lost much of its importance, but it is connected with Mecca by motor highway. During the First Great War it was captured from the Turks by the Hejaz Arabs in 1916. A municipal council was instituted by King Ibn Saud. Here is a British embassy. Pop. 30,000.

Jeep. Colloquial name for the general purposes (G.P., hence jeep) truck originally developed by Willys-Overland for the U.S. army in 1939-40. Quickly proving its value in every branch of land warfare as a small but powerful vehicle, the jeep was adopted by the United Nations as standard equipment, an average of over 100,000 being produced annually during the Second Great War. Only 11 ft. long and about 5 ft. in width, the jeep was driven by a four-cylinder engine that developed up to 60 h.p., and had a two- or four-wheel drive that afforded a large choice of gears for varying loads, surfaces, and gradients. It could tow a trailer or light gun, and it was

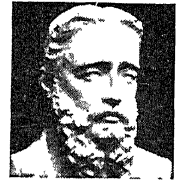
adapted as an amphibious vehicle; for drawing railway "jeep trains," also as a farm tractor.

Jeeves. A character in several books of comic short stories by P. G. Wodehouse. He first appeared in the Strand Magazine in 1915; then in collections, i.e. The Inimitable Jeeves, 1924. A Jeeves Omnibus was published in 1931. Valet to Bertie Wooster, he is distinguished by faultless behaviour, the literary English of his conversation, and an astuteness which enables his master to outmanoeuvre all comers.

Jefferies, (JOHN) RICHARD (1848-87). British essayist. Born near Swindon, Nov. 6, 1848, he became a writer on wild life, his essays being collected, e.g. The Gamekeeper at Home, 1878; Wild Life in a Southern County, 1879. More imaginative work is in Wood Magic, 1881, and Bevis: the Story of a Boy, 1882.

The Story of My Heart, 1888, is an engrossing autobiography. A conscious artist in words, often at lyrical and impassioned pitch, Jefferies knew nature accurately, and not sentimentally. He died at Goring, Aug. 14, 1887, and is buried at Broadwater. There are studies of his life and work by Edward Thomas, new ed. 1938; Henry Williamson, new ed. 1947. His Nature Diaries and Notebooks were edited by S. J. Looker, 1941.

Jefferson. River of Montana, U.S.A. Rising in the Rocky Mts., in the S.W. part of the state, it flows 200 m. N.E. to its junction with the Gallatin and Madison rivers, forming with them the three main forks of the Missouri.



Richard Jefferies, British essayist
From a bust by M. Thomas



Jeep. The G.P. truck widely used by the United Nations in the Second Great War. Here Lord Mountbatten is seen at the wheel, conducting an inspection of military installations in Ceylon

Jefferson, CITY OF. Capital of Missouri, U.S.A. and the co. seat of Cole co. On the right bank of the Missouri river, 125 m. W. of St. Louis, it is served by rlys. and an airport. Among the chief buildings are the capitol, executive mansion, and supreme court building. Lincoln university for Negroes is here. The city lies in an agricultural and coal and zinc mining district, has rly. workshops, and manufactures clothing, boots, and shoes, farming implements, flour, beer, and bricks. The site was chosen for state capital 1821. Named after the third president of the U.S.A., it became a city in 1839. Federal troops occupied it in the Civil War. Pop. 24,268.

Jefferson, THOMAS (1743-1826). Third president of the U.S.A. He was born at Shadwell, Albemarle co., Virginia, April 13, 1743. A barrister, he early attracted attention by his advanced opinions. As a member of the second Continental Congress he was principal author of the Declaration of Independence, July 4, 1776. While governor of Virginia, 1779-81, he was severely criticised for having failed to organize an adequate defence, but afterwards exonerated. In congress, 1783-84, he supported the decimal coinage system, in which America led the way.

Having been minister to France, 1785-89, Jefferson became secretary of state under Washington in 1790, and leader of the Democratic-Republican (afterwards the Democratic) party, which upheld the sovereignty of the individual states as opposed to centralised government. His great rival in the cabinet was Alexander Hamilton. When France and England engaged in hostilities Jefferson favoured active intervention on the side of France, but treatment of American envoys by the Directory brought about a great revulsion of feeling which nearly led to war with France.

From 1797 Jefferson was vice-president under Adams. At the presidential election of 1800 he tied with Aaron Burr by electoral votes and was named president by the house of representatives. For the 1805-09 term he was re-elected easily. He sent an expedition against the Tripoli pirates; purchased Louisiana from the

French; effected a reduction in the national debt; and issued an embargo prohibiting the sailing of American vessels for foreign ports. Refusing to stand for a third term, he interested himself in the foundation and development of the university of Virginia. He died July 4, 1826, the same day as his predecessor Adams and on the jubilee of the Declaration of Independence.

Bibliography. Lives, H. S. Randall, 1871; W. E. Curtis, new ed. 1926; *Life and Letters*, F. W. Hirst, 1926; Jefferson and Hamilton, C. G. Bowers, 1926; *The American Heresy*, C. Hollis, 1928; *Letters of Lafayette and Jefferson*, ed. G. Chinnan, 1930; *The Young Jefferson, 1734-89*, C. G. Bowers, 1945.

Jefferson Memorial. Monument in Washington, D.C., erected on the shore of the tidal basin in East Potomac Park as a tribute to the author of the Declaration of Independence. Its cost was met by a congressional appropriation of three million dollars. Dedicated by F. D. Roosevelt on April 13, 1943, the 200th anniversary of Jefferson's birth, it has a central chamber 80 ft. in diameter and is dominated by an heroic standing figure. Quotations from Jefferson's writings are inscribed on the panels of the room. The memorial was designed by John Russell Pope, assisted by Otto Eagers and D. P. Higgins.

Jeffersonville. City of Indiana, U.S.A., the co. seat of Clark co. On the Ohio river, facing Louisville, it is served by the Baltimore and Ohio South-Western rlys. Bridge, ferry, and trams connect Jeffersonville with Louisville, where many of its residents work. It has the deepest harbour between Pittsburgh and Cairo, Ill. The Ohio Falls, 26 ft., provide power for industrial establishments, which include rly. works, machine shops, plants making soap and shirts, and an army quartermaster supply depot. To the E. is the world's largest powder factory. Laid out in 1802 by W. H. Harrison according to a plan suggested by Thomas Jefferson, the town became a city in 1890. It was inundated in 1937 by the Ohio. Pop. 11,493.

Jeffrey, FRANCIS JEFFREY, LORD (1773-1850). Scottish lawyer and critic. He was born in Edinburgh, Oct. 23, 1773, and educated at the universities of Glasgow and

Edinburgh, and at Queen's College, Oxford. Entering parliament for Perth in 1830, he became lord advocate, and was made a Scottish law lord in 1834. He died at Craigherook, near Edinburgh, Jan. 26, 1850. Jeffrey was one of the founders in 1802 and first editor of *The Edinburgh Review*. He was regarded by his contemporaries as the prince of literary critics, but his utter failure to appreciate the great romantic movement in the literature of his time has led to a modification of this opinion. Merciless in criticism, he was a man of most amiable character. His essays were published in 4 volumes, 1844 and 1853, and his life was written by Lord Cockburn, 1852.

Jeffreys, GEORGE JEFFREYS, 1ST BARON (1648-89). A judge of the English court. Born at Acton, Denbighshire, Jeffreys was educated at S. Paul's and Westminster, and at Trinity College, Cambridge. Called to the bar in 1668, he made a reputation in the courts, chiefly by his hectoring manner. In 1678 he became, through court influence, recorder of the City of London, and was the leading figure in the relentless prosecution of persons involved in the so-called Popish Plot (*q.v.*), and in the trials of the Rye House plotters, and of Titus Oates. Chief justice of the king's bench, 1683, in 1685 he was made a baron. Jeffreys made himself notorious that year in the trial of the rebels who followed Monmouth. His reward was the lord chancellorship, in which capacity he made determined efforts to secure the unconstitutional claims of James II. After the Revolution of 1688 he was arrested while trying to escape overseas, and died a prisoner in the Tower, April 18, 1689. *Consult* Life, H. B. Irving, 1898; *The Bloody Assize*, E. Parry, 1929; Jeffreys of the Bloody Assize, S. Schofield, 1937.

Jehangir (1569-1627). Mogul emperor. Son of Akbar the Great, he succeeded him in 1605. His name was Salim, but he assumed the title of Jehangir or Jahangir (conqueror of the world). He had been viceroy of S. and W. India and lived in Agra as heir apparent. On his accession he declared himself a Muslim, but tolerated both



Th. Jefferson



1st Baron Jeffreys,
English lawyer
After Kneller



Lord Jeffrey,
Scottish lawyer
After Hayter

Christians and Hindus. Despite outstanding ability as a ruler and appreciation of literature and the arts, Jehangir was capricious and tyrannical. His reign was marked by his sons' rebellions, the loss of Kandahar to Persia in 1622, and the sanctioning of English trade at Surat. His wife, Nour Jahan, was famed for beauty and wit.

Jehoiachin. King of Judah in succession to his father Jehoiakim. He is also called Jeconiah, Jechoniah, and Coniah. He reigned for three months in 597 B.C., and was carried as captive to Babylon by Nebuchadrezzar. After 35 years of imprisonment, Evil-Merodach released him and provided for him during the rest of his life (2 Kings 24, 25).

Jehoiada. High priest of Jerusalem during the reigns of Ahaziah, Athaliah, and Joash (2 Kings 11). He protected Joash in his boyhood, when Athaliah wished to have him killed, and later arranged with the leaders of the army to place him on the throne (836 B.C.). He abolished the worship of Baal, raised funds for the restoration of the Temple, and was buried among the kings.

Jehoiakim. A king of Judah. The son of Josiah, he was made king by Pharaoh Necho, the country at that time being under Egyptian domination. His reign lasted eleven years (608-597 B.C.), during three of which he was the vassal of Nebuchadrezzar. Idolatry and vice flourished in his reign (2 Kings 23, 24).

Jehol. One of the Inner Mongolian provinces of China. Covering 74,297 sq. m., it contains 16 counties, with Chengteh as its capital, 120 m. N.E. of Peiping. Other important cities are Pingchuan, Chaoyang, and Chihfeng. The only rly. is the Liaoning-Jehol line, but there are highways to neighbouring provinces. Chief products are wheat, kaoliang, corn, medical herbs, coal, and gold. The province was formerly the favourite country seat of the Manchu emperors. Many lama monasteries serve the religious needs of Mongolian banners (clans).

In 1931 Japan, on the pretext that China was unable to suppress banditry in Manchuria, dispatched forces to seize control of that region and also of Jehol. Military operations followed, and on Feb. 18, 1932, Jehol and the three N.E. provinces of China were, with the assistance of Japan, proclaimed an independent state under the name of Manchukuo. This state collapsed with the defeat of Japan in the Second Great War in Aug.

1945, and the provinces were again incorporated in China. Tension growing between the national government and the Chinese Communists in Manchuria, government forces entered Jehol in Nov. and established control over the province. Pop. 2,185,000.

Jehoshaphat. King of Judah, 876-851 B.C. He came to the throne in succession to his father, Asa. In his earlier years he did much to exterminate idolatry, and built numerous strongholds. An alliance with Ahab, king of Israel, led him to take part in the battle of Ramoth Gilead, where he narrowly escaped with his life. Later he was at war with Moab and Ammon. He joined Ahaziah in sending a maritime expedition to Tarshish to obtain gold from Ophir, but his fleet was destroyed at Ezion-Geber (1 Kings 22; 2 Chron. 17-20).

Jehoshaphat, VALLEY OF. Valley mentioned by Joel (3v. 2) in one of his prophecies. It is believed to be that lying between Jerusalem and the Mt. of Olives, along which the Kidron flows.

Jehovah. Proper name of the God of Israel. It is the name by which (Exod. 3, 12-15) He revealed Himself to Moses at Horeb. Jehovah is an artificial pronunciation of the consonants Jhvh or Yhwh (the so-called tetragrammaton). Of the name regarded by the ancient Jews as a *nomen ineffabile*, a name too sacred to be pronounced (*cf.* Exod. 20, 7; Lev. 24, 11), the true pronunciation was lost.

The present pronunciation is obtained by giving to the consonants the vowels of another divine name, *Adonai* (*q.v.*), which means simply "My Lord." According to a tradition preserved by Theodoret and Epiphanius, the word was pronounced Ya-be. This seems to indicate Jahveh or Jahweh, Yahweh or Yahveh, a pronunciation adopted by many modern scholars. The word then gains a suitable meaning, either "he who causes to be" (giver of existence), or "he who is" (the absolute and unchangeable one).

According to Exod. 6, 3, God did not make Himself known to the patriarchs as Jhvh; to them He was El Shaddai (God Almighty). Yet the name is already found in Gen. 4, 26; 12, 8, etc. The discrepancy has been explained by supposing the meaning to be that God did not fully reveal Himself by this name before the time of Moses. But if the documentary hypothesis is accepted, the explanation is that the passage in Exodus belongs to a different

document. See God; Hebrew Religion; Hexateuch; Jahvist.

Jehovah's Witnesses. Religious cult originating in the U.S.A. Its name comes from Isaiah 43, 10. Alternative names are the Watch Tower and Bible Tract Society and the International Bible Students' Association. It was founded in 1872 by Charles Russell (known as Pastor Russell) at Allegheny, Pa.; on his death in 1916 his mantle fell on "Judge" Joseph Franklin Rutherford, who, dying in 1942, was succeeded by Nathan Knorr. Its theology is fundamentalist; it is opposed to all forms of organized religion, and has no church buildings. Members are conscientious objectors to military service, who also refuse to vote, serve on a jury, or salute the national flag. Propaganda is carried on mainly by door-to-door distribution of tracts and pamphlets. The movement spread rapidly to other countries, and its followers were estimated in 1946 at nearly three millions, half a million being in the U.S.A.

Jehu. Son of Jehoshaphat, and king of Israel, 843-815 B.C. He is styled "son of Nimshi," but was actually his grandson. Originally one of Ahab's guard, he became a general under Jehoram, and during the illness of that king was proclaimed king by acclamation of the army (2 Kings 9). He slew Jehoram at Naboth, and had 70 members of Ahab's family assassinated, with forty-two princes of the house of Ahaziah. He slew all the priests of Baal at Samaria. To protect himself against the Syrians, he formed an alliance with Shalmaneser II of Assyria. He was buried at Samaria. The reference to his furious driving (verse 20) has made his name a synonym for a driver of horses.

Jejeebhoy, SIR JAMSETJEE (1783-1859). Parsee merchant and philanthropist. Born at Bombay,



Sir J. Jejeebhoy,
Parsee merchant

July 15, 1783, he became partner in a mercantile business, and, taking full advantage of the expansion of Indian trade with Europe, he amassed a huge fortune, much of which he devoted to philanthropic uses. He founded the Parsee Benevolent Institution at Bombay, built the Mahim Causeway, and defrayed the bulk of the cost of the waterworks at

Poona. He was knighted in 1842, created a baronet in 1857, and died April 14, 1859.

Jejunum (Lat. *jejunus*, fasting, empty). First two-fifths of the small intestine. It is about eight feet in length, beginning at the duodenum and passing into the ileum. It is so called because in post-mortem examinations it is usually found empty.

Jekyll and Hyde. Popular term for a "dual personality." In R. L. Stevenson's book, with full title *The Strange Case of Dr. Jekyll and Mr. Hyde*, pub. 1886, the central character is an individual who is at different times the highly worthy Dr. Jekyll and the reprehensible Mr. Hyde. H. B. Irving portrayed both aspects of the man in a stage adaptation by J. Comyns Carr, 1910. Fredric March did the same in a film in 1932.

Jelgava (Ger. *Mitau*). City of Latvia S.S.R. It is a rly. junction and inland harbour, on the river Lielupe, about 25 m. S.W. of Riga. It had the largest Latvian sugar factory, flour and timber mills, brick kilns, and textile factories, and was also a marketing centre. There were government offices, and the academy and chamber of agriculture were housed in the ancient ducal palace, a beautiful example of Italian baroque. The town grew around a castle built in 1265 by the Teutonic Order. In 1576 Jelgava received civic rights as capital of the new duchy of Courland, and was the metropolis until in 1795 the duchy was absorbed by Russia. Here the exiled Louis XVIII of France held court, and his Irish confessor, Abbé Edgeworth, is buried. Jelgava has suffered in many wars, being in an open plain accessible to invading troops. In the war of Latvian liberation it was damaged by troops of the German-Russian adventurer Avaloff. Overrun by the Germans during the Second Great War in June, 1941, it was recaptured by Russian troops in July, 1944, after bitter fighting in which it was almost destroyed. Pop. (pre-war) 34,099.

Jellachich, JOSEPH, COUNT (1801-59). Croatian soldier. He was born at Peterwardein, Oct. 16, 1801, and entered the Austrian army. His career was uneventful until in 1848 he was appointed governor or ban of Croatia-Slavonia. In Sept. he led an army of Croats across the Drave into Hungary, for the Magyars, themselves rising against the Austrian empire, were hostile to the demand of the Croats for independence. This

force helped Windischgrätz to recover the capital for the Austrian emperor. In 1849 Jellachich was beaten and returned to Croatia, and in 1853 he led an army against Montenegro. A count from 1855, he died May 20, 1859.

Jellicoe, JOHN RUSHWORTH JELlicoe, 1ST EARL (1859-1935). British sailor. Born at Southampton, Dec. 5, 1859, he was the son of a commodore of the Royal Mail Steam Packet Co., and entered the Royal Navy in 1872 as midshipman in the *Britannia*. As lieutenant he served in 1882



Earl Jellicoe,
British sailor
Spaight

with the naval brigade at Tel-el-Kebir. In 1886 in the battleship *Monarch* he performed the life-saving feat for which he was awarded the Board of Trade medal. In 1893 he was a commander in the *Victoria* when that ship was lost in the Mediterranean. Chief of staff on the China station in 1900, he commanded the naval brigade sent to relieve the Peking legations. During 1905-07 he was director of naval ordnance, then second in command of the Atlantic Fleet. Created K.C.V.O. and promoted to flag rank in 1907, he became 3rd sea lord in 1908, and was placed in charge of naval construction. He commanded the Atlantic Fleet, 1910-11, and the 2nd squadron of the Home Fleet, 1911-12, when he was appointed 2nd sea lord.

Just before the outbreak of the First Great War, Jellicoe was ordered to Scapa Flow. As c.-in-c. of the Grand Fleet he had immense difficulties to overcome in bringing it to efficiency. But constant sweeps were carried out to cover the cruiser forces watching the North Sea and blockading Germany. On May 30, 1916, Jellicoe received information that the German High Seas Fleet was making for the Skagerak, and he put to sea with all available ships to fight his only action of the war. On May 31 the battle of Jutland (*q.v.*) took place. Heavy losses in ships and the indecisive result of the engagement caused public disappointment.

On Nov. 28, Jellicoe was appointed 1st sea lord and relinquished command of the fleet to Sir David Beatty. He organized fresh measures against the U-boat campaign and adopted new anti-

submarine weapons. If his general policy was marked by over-caution, it must be remembered that he had to meet new conditions introduced by the submarine and mine. He had to cope with shortage of destroyers and unsatisfactory shells. Retiring from the active list, in 1918 he was raised to the peerage as Viscount Jellicoe of Scapa. Already O.M., he received a grant of £50,000. Promoted admiral of the fleet in 1919, he was gov.-general of New Zealand, 1920-24, created an earl in 1925, and president of the British Legion, 1928-32. He died Nov. 20, 1935, and was buried in St. Paul's cathedral. His bust, by C. Wheeler, was placed in Trafalgar Square, 1948. His son George (b. 1918) succeeded to the title. *Consult* Life, R. H. Bacon, 1936.

Jelly. State of matter induced in certain liquids by the addition of colloid substances like gelatine, silicic acid, or pectin. In boiled concentrated fruit juices pectin coagulates, with sugars, organic acids, etc., to form fruit jellies. The jellies of the confectioners' shops are, however, gelatine and water mixtures flavoured. Agar-agar (*q.v.*) is widely manufactured into jellies in the East for food and is used in the West as a culture medium in bacteriology. *See* Jam.

Jellyby, Mrs. Character in Dickens's novel *Bleak House*. She is remembered for her constant preoccupation with the administration of schemes for the welfare of the natives of Borrioboola-Gha, to the complete disregard of all the immediate responsibilities of her home and her numerous family.

Jelly-fish. Popular name applied to medusae. They are found as a stage in the life of many Hydromedusae and are the chief form of Scyphomedusae, which have a kind of tube or gullet between mouth and stomach. Essentially the medusa is a short-lived, widened polyp. In the Hydromedusae it is produced as a special bud by modified polyps of hydroid form.

In the more common forms of free-swimming jelly-fish, the animal resembles a bell or parachute of translucent gelatinous matter, fringed with waving tentacles, some of which have the power of stinging or paralyzing the minute creatures on which the animal feeds. Some species can inflict a painful sting upon swimmers who come in contact with them. Many species occur around the British coasts, one, *Aurelia aurita*, often seen cast up on the beach in

autumn, being about 7 ins. across. In the tropics huge species exist.

The egg hatches out as a free-swimming larva which fixes itself on some object and develops into a hydroid form about $\frac{1}{2}$ in. long. This alternately widens out and contracts till it resembles a small pile of plates. The top one splits off, floats away, and develops into an adult jelly-fish. This process is repeated until the pile is disposed of.

The common jelly-fish swims by alternately expanding and contracting its parachute or bell, thus thrusting itself forward by the forcible expulsion of the contained water; but in some other groups the tentacles play the part of paddles. The food consists mainly of minute crustaceans. A few freshwater species are known; *Limnocolodium sowerbyi* made its appearance years ago in a tank in the botanical gardens, Regent's Park, London, probably introduced with a water lily from S. America. The fresh-water *Hydra* does not form a jelly-fish. See Coelenterata.

Jemappes. Town of Belgium. In the prov. of Hainaut, it is 4 m. W. of Mons, with which it is connected by a canal. Its industries are mainly connected with the coal mines in the district. There are also glass works. Pop. 14,000.

Jemappes is famous for the battle fought here between the French and the Austrians, Nov. 6, 1792. The French were invading Belgium, then the Austrian Netherlands, when they were met by an Austrian force of 28,000 men. The former, under Dumouriez, were superior in numbers, and gained a victory, decisive because it placed the southern Netherlands in their power. The French lost about 1,000 men, the Austrians about 7,000. There was also fighting here during the First Great War, when on Aug. 23-24, 1914, the British blew up the bridge in face of the advancing Germans. See Mons.

Jemmy. A short crowbar, or a longer one made in sections so as to be easily carried. The name is associated with the implement used by burglars to force doors or windows, but a similar tool is used by mechanics and engineers. The short crowbar has a thin, curved blade and is made of fine steel.

Jena. A town of Thuringia, Germany. It lies on the left bank of the Saale, 56 m. S.W. by rly. from Leipzig. Mentioned first in 863, it possessed municipal rights in the 13th century; from 1331 belonged to different branches of the Wettin (Saxon) dynasty; and was part of the grand duchy of



Jena. University of this town of Thuringia. It numbers Schiller and Hegel among its famous professors

Saxe-Weimar from 1741 to 1918. The university, founded 1558, enjoyed an international reputation in the 18th century when Schiller, Fichte, Hegel, and Schelling taught there. A library, archaeological museum, observatory, botanical garden, and institute for seismology were attached.

The old town contains remnants of fortifications, a Gothic town hall (1340), the old town church, a reconstructed R.C. church of the 11th century, and fine private dwellings. Jena possesses notable modern educational institutions, many of which were endowed by Carl Zeiss, or his successor Ernst Abbe. Until the Second Great War it was a publishing centre. The famous Zeiss firm of optical instrument makers had its headquarters here, with affiliated glass factories, and a state school of opticians. Captured by U.S. troops on April 13, 1945, Jena came into the Russian zone of Germany. Part of the Zeiss works was dismantled and transported to the U.S.S.R. as war reparations; but a limited supply of glass for the remaining part was assured through the production of Schott glass. Pop., pre-war, 60,760. Pron. Yay-na.

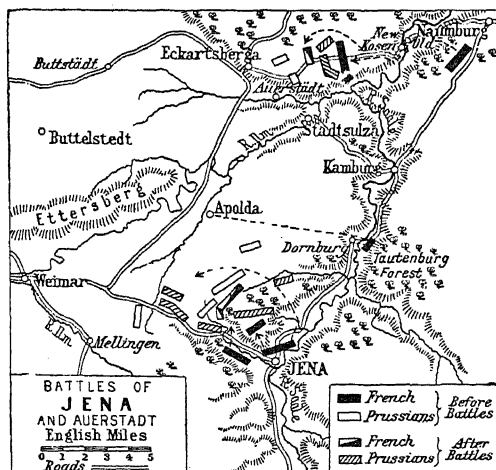
Jena, BATTLE or. Fought between the French and combined Prussians and Saxons, Oct. 14, 1806. During the campaign of Austerlitz there

had been causes of dispute between Napoleon and Prussia, and the Austrians counted on Prussian help; but not until Bonaparte was leading his victorious troops back to France did Prussia declare war. Napoleon acted promptly. On Oct. 3 his army of 190,000 men was resting on the line from Lichtenfels to Würzburg, and he immediately

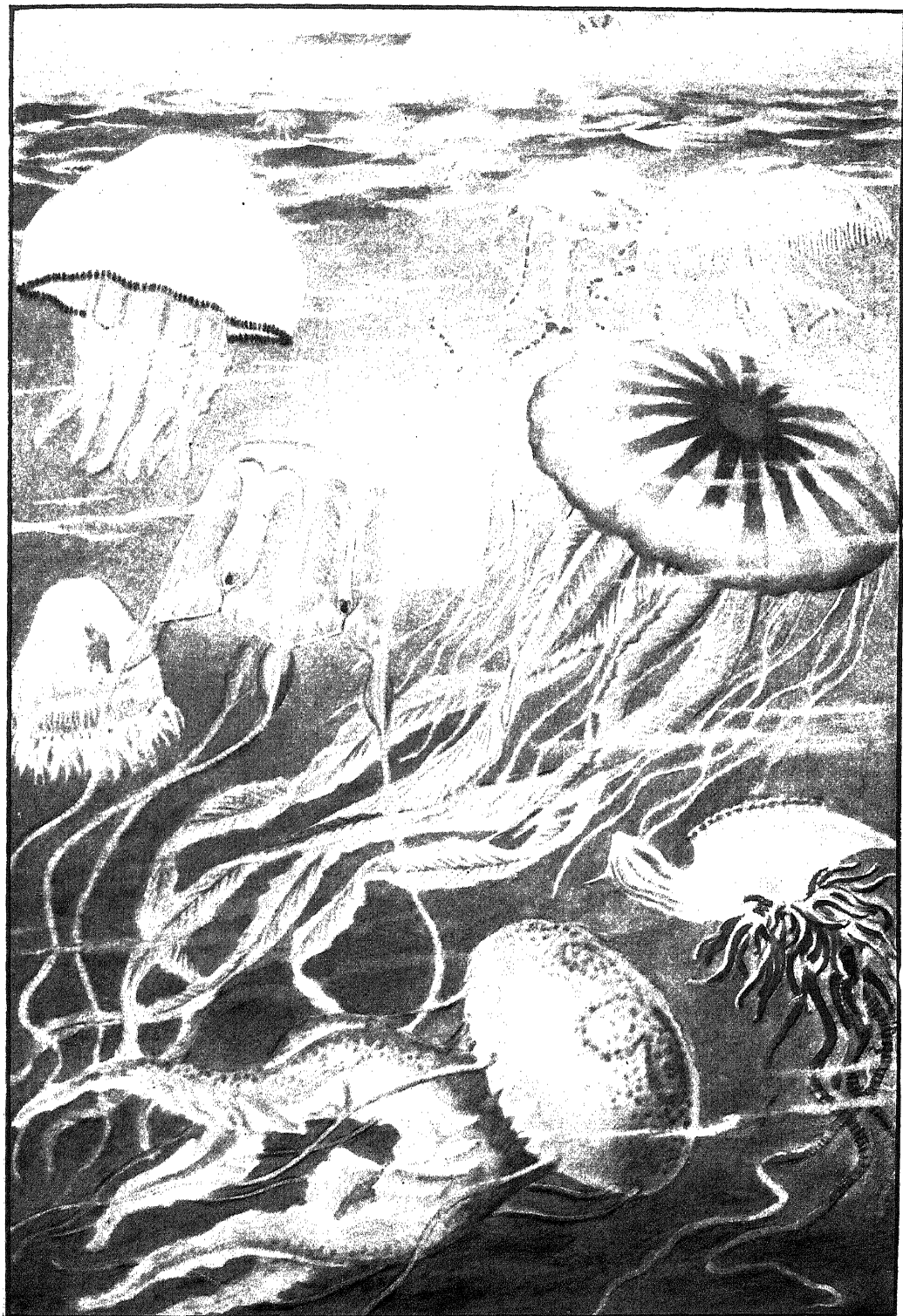
began a movement N. to pass the defiles of the Thuringian Forest.

The Elbe was the natural defensive line for the Prussians, but their commander, the duke of Brunswick, moved forward to Thuringia and joined the Saxons. He had about 143,000 men, untried, with old-fashioned methods; 44,000 were semi-independent, under Prince Hohenlohe. Brunswick had decided to pass the forest, but Napoleon had the initiative, and the Prussians concentrated about Weimar. On the 9th the French crossed the Saale, and Napoleon, pivoting his left on that river, decided to swing round his right to crush Hohenlohe, and cut off the Prussians from the Elbe. Brunswick attempted to cross the Saale, sending his main body towards Naumburg and Hohenlohe to Jena, but Napoleon seized these crossings on the 12th.

Thus, on the 14th, Napoleon had the easier task. The valley of the



Jena. Plan explaining the tactics of Napoleon at the battles of Jena and Auerstadt



1. *Rhizostoma pulmo*. 2. *Carmarina hastata*. 3. *Aurelia aurita*. 4. *Chrysaora mediterranea*. 5. *Charybdea marsupialis*. 6. *Turris digitalis*. 7. *Pelagia noctiluca* (a coelenterate colony of many strangely modified polyps, equipped with a float, and looking rather like a true jelly-fish). 8. *Physalia pelagica*

JELLY-FISH : FLOATING INVERTEBRATES OF THE OCEAN

Saale widens out at Jena, but there are hills on the left bank, the highest of which he had seized. He ascended the hill, thinking he had the bulk of the enemy in front of him, and made his dispositions accordingly. The morning was misty and, unobserved, he strengthened his force on the hill, also sending corps round each side.



Jenghiz Khan,
Mongol and Tartar emperor

Hohenlohe attacked the hill, thinking he had only a small body in front of him. His inexperienced infantry, when received by French fire, simply halted to return the fire, and could not progress even when reinforced; the German cavalry made futile squadron attacks. At 2 p.m. Napoleon launched the Guard corps and his cavalry to complete the victory, and drove Hohenlohe's disorganized force to meet the stream of fugitives from Auerstädt. Brunswick's command was routed with a loss in both battles of 40,000 men and 200 guns. The French loss was about 14,000, but so decisive were the battles that Napoleon was able to march without serious opposition to Berlin. See Auerstädt, Battle of; Napoleonic Campaigns.

Jenatsch, GEORG (1596-1639). Swiss patriot. Born at Samaden, Upper Engadine, he became a pastor and a violent supporter of the Protestant party in the Grisons. As a reprisal for the torture of an R.C. priest, the Spaniards seized the Valtellina, 1620. Jenatsch sought French aid to recover this valley, and in 1635 accompanied Rohan on his campaign to achieve that object. The French, however, retained possession, and Jenatsch, negotiating with Spain and Austria, organized a conspiracy which drove them out, 1637. When they were replaced by the Spaniards, Jenatsch was assassinated, Jan. 24, 1639. His own record included several murders.

Jenghiz Khan (1162-1227). A Mongol and Tartar emperor. Son of a petty chieftain, he was born in N. Mongolia, and succeeded his father while still a boy. From about 1177 he was involved in almost unbroken warfare with various tribes previously under his father's sway, winning a notable victory over Oungh Khan of the Keraites in 1202; and in 1206 he was able to proclaim himself khan or emperor, adopting the name of

Jenghiz, i.e. perfect warrior. He almost completed the conquest of the N. provinces of China, 1213-15, and in 1215 married a daughter of the former emperor of China.

Further wars spread his dominion W. beyond the Jaxartes in Turkistan and to Bokhara, 1219. Then until 1222 his armies penetrated through Samarkand into Khorasan, to Mery, and into Georgia; they crossed the Indus to Peshawar and Lahore; they sacked Herat; and further campaigns made him ruler over almost the whole Chinese empire. In these years the most atrocious massacres were carried out in every city that showed resistance. This scarcely paralleled but inhuman conqueror is credited with an extremely enlightened legal code and skilful administration of his far-spread possessions. He died while returning from a campaign in China, Aug. 24, 1227. See Kublai Khan.

Jenil or **GENIL**. River of Spain. It rises in the Sierra Nevada, near Mulhacen, and flows across Granada and between Córdoba and Seville to its confluence with the Guadalquivir, 33 m. S.W. of Córdoba. Length about 120 m.

Jenkin, HENRY CHARLES FLEEMING (1833-85). A British engineer. Born near Dungeness, March 25, 1833, he became an electrical engineer, and in 1859 entered into partnership with Sir W. Thomson (afterwards Lord Kelvin). He was member of a committee to determine practical electrical units, and invented the telfer system of overhead transport. Professor of engineering at London, 1865, and Edinburgh, 1868, in 1879 he was vice-president of the Royal Society of Edinburgh. R. L. Stevenson acted as his secretary at the Paris exhibition of 1878, and after his death on June 12, 1885, wrote a memoir.

Jenkins's Ear, WAR OF. Name popularly given to the war between England and Spain in 1739, which ultimately merged into the War of the Austrian Succession. Capt. Robert Jenkins was in 1731 bringing home from Jamaica the brig Rebecca when, on April 9 off Havana, his ship was boarded by a party from a Spanish coastguard vessel who rifled the cargo. The story was that the Spanish commander cut off one of Jenkins's

ears and bade him carry it to his king and say that if the king had been present he would have been treated the same way. On arrival in England, Jenkins stated his grievance to the government, but little notice was taken; and historians now incline to the view that the ear had probably been lost in the pillory. In 1738 Jenkins at the bar of the house of commons repeated his story with much dramatic detail. The recital created public excitement which, supported by Pitt and others, led to a declaration of war against Spain in 1742 and to the downfall of Walpole. Jenkins was given command of a ship of the East India Co. and became supervisor of the company's affairs at St. Helena, where he appears to have died in 1745.

Jenkinson, ANTHONY (d. 1611). English sailor and traveller. After a youth spent in voyages to the Levant he was appointed captain-general of the Muscovy Company's fleet in 1557. Landing at St. Nicholas on the Dvina in that year, he made his way into inland Russia, visited Ivan the Terrible at Moscow, pushed S. to the Caspian Sea, went to Bokhara, and returned to Moscow and England in 1560. Jenkinson was one of the first Englishmen to travel in Russia, and his courage won for him the friendship of Ivan, who granted valuable trading concessions to his employers. He retired in 1572.

Jenne. City of Africa. In the French colony of Sudan, it is about 250 m. S.W. of Timbuktu and not far S. of the Niger river, with which it is connected by a natural canal. It was once the capital of the Songhai empire. Pop. 5,326.

Jenner, EDWARD (1749-1823). English doctor, the originator of vaccination. Born at Berkeley, May 17, 1749, he was the son of the vicar. Educated at local schools, he was apprenticed to a surgeon at Sudbury, but after a time came to London and studied under John Hunter. He returned to Berkeley to practise medicine from 1773 until his death, Jan. 25, 1823.

Jenner had always given some thought to the subject of small-pox, partly because of the rustic belief that there was a connexion between it and cow-pox. Early



Edw. Jenner
From an engraving

efforts to prove his theory that inoculation with the latter would prevent smallpox were mainly casual if considered inquiries, but about 1775 he began to study the disease more intensively. He made his first inoculation in May, 1796, on a boy, who was afterwards shown to be immune from smallpox. Despite opposition the practice of vaccination made great headway, both in Great Britain and abroad. A society named after the inventor was formed to promote it. In 1802 parliament voted £10,000 to Jenner and in 1806 a further £20,000. Additional gifts were made to him, much going towards the advocacy of the cause. There are Lives of Jenner by J. Baron, 1838; F. D. Drewitt, 1931. *See Vaccination.*

Jenner, Sir William (1815-98). British physician. Born at Chatham, Jan. 30, 1815, he was educated there and at University College, London.



Sir William Jenner,
British physician
After F. Hall

Devoting himself to research rather than to general practice, in 1849 he was made professor of pathological anatomy at University College, later becoming professor of the principles and practice of medicine. He was physician at several London hospitals. As physician to the queen and royal family he attended the prince consort and the prince of Wales when they were attacked by typhoid fever. In 1864 he was made F.R.S. and in 1868 a baronet. He was president of the College of Physicians, 1881-88. He died Dec. 11, 1898. Jenner wrote much on fever, and established the difference between typhus and typhoid.

Jennings, Sarah (1660-1744). The maiden name of the wife of the 1st duke of Marlborough. *See Marlborough, Duchess of.*

Jenolan Caves. Best known of a series of limestone caverns in New South Wales, Australia. The limestone, which outcrops in an area extending from Yarrangobilly, N. of the Murray river, to Wellington, S. of the Macquarie river, contains fossil marine shells and corals of Devonian and Silurian age. At Wellington Cave were found fossil bones of a 16 ft. wombat and of extinct emus. Jenolan caves are remarkable for the beauty of the stalactite and stalagmite formations which characterise the underground chambers.

Jensen, Johannes Vilhelm (b. 1873). Danish poet and author, born at Farso, Jan. 20, 1873. He established his reputation with a decadent impressionism, a trend still showing in his Einar Elkjaer, 1898. After a journey to America, he developed a new realism and a style to match which brought him to the forefront of European literature. His cycle of novels, *The Long Journey*, 1909-21, depicted mankind's evolution. He wrote the saga of his own race in *Himmerland Stories*, 1898-1910. Grotesque American tales were *Madame d'Ora*, 1904, and *The Wheel*, 1905. From the later 1920's he concentrated on semi-philosophical writing. In 1944 he received the Nobel prize for literature.

Jephthah. One of the judges of Israel. An illegitimate son of Gilead, he became leader of a band of freebooters, and was asked by the Gileadite elders, who expected an invasion of the Ammonites, to command the army. This he agreed to do on condition that he was made judge (Judges xi, xii). He won a complete victory over the enemy at Rabbath-Ammon. He had vowed to God that, if successful, he would sacrifice the first thing he met on his return; to his horror, it proved to be his own daughter. Jephthah ruled six years.

Jerba. Island of N. Africa, in the Gulf of Gabès. It belongs to Tunis, and has been called the island of the lotus eaters. Olives and dates are produced, and there is a sponge fishery. Among Roman remains is an arch in honour of Marcus Aurelius and Verus. Jerba town is on the N. coast.

Jerboa (Arabic *yarbi*, two-footed). Family of small rodents, found in the sandy regions of E. Europe, Asia, and North Africa. Mouse-like in general form, with remarkably short forelegs and very

long hind ones, they take long leaps, like miniature kangaroos. The tail is long and tufted at the



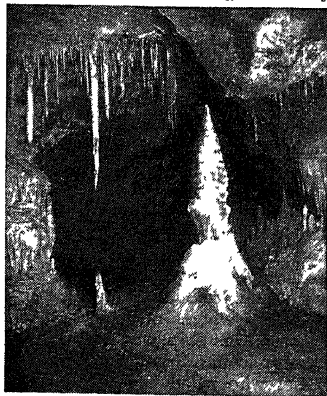
Jerboa. Small leaping rodent sometimes called the desert rat.

extremity. The commoner species are about 6 ins. long and have light-brown fur. They live in burrows, and their food consists of roots and seeds, insects, and birds' eggs. They often do great damage to crops.

The jerboa is the desert rat adopted as nickname and sign by the British 7th armoured div. in N. Africa in the Second Great War. *See Desert Rats.*

Jeremiah. A Hebrew prophet, whose story and prophecies are recorded in one of the books of the O.T. Described as "the noblest patriot and the greatest prophet of his age," he received his call in 626 B.C. and was active during a critical period of Hebrew history. The power of Assyria was collapsing before Babylon; the small states to the W., including Judah, were attempting to secure their freedom; Egypt was seeking hegemony over Palestine and Syria. For some years Judah was under Egyptian control, but Pharaoh Necho was defeated at Carchemish in 605 by Nabopolassar of Babylon, and Jerusalem was eventually captured by the latter's successor, Nebuchadnezzar. In 586 Jeremiah escaped with some of his countrymen to Egypt, where, according to a late tradition, he suffered martyrdom at the hands of his companions.

The religious reforms of Josiah occasioned Jeremiah's first utterances, though he seems to have supported the reforms at first. The unscrupulous Jehoiakim, who implicated his country in a revolt against Nebuchadnezzar, aroused the prophet's opposition. He predicted the imminent fall of Jerusalem as the punishment of God upon rebellious people. For this he was fiercely persecuted. As a patriot, he did his utmost to dissuade his countrymen from being influenced by illusory hopes of independence. To give his warnings he had to cut himself from the peaceful family and social life for which he longed. He was a prophet against his will; his greatest desire was to go away and live in peace. But he found



Jenolan Caves, New South Wales.
The Minaret stalagmite

it possible to have a personal, spiritual relationship with God apart from the community and the organized *cultus*. This discovery, embodied in his teaching on the new covenant in chapter 31, is his greatest contribution to O.T. thought, and was of outstanding importance during the Exile.

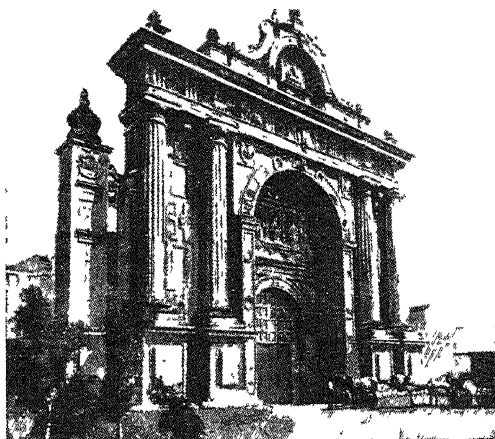
The book of Jeremiah consists partly of narrative and partly of discourses. We are told something of its origin in chapter 36. For 23 years the prophet delivered his message orally. In 604 these messages were written down at dictation by his friend and disciple Baruch. The roll was cut up and burned by Jehoiakim; Baruch wrote down the discourses again and made additions. The text of the book is in some disorder. Three parts, each containing passages throughout the book, have been distinguished: (1) prophecies written by Jeremiah; (2) biographical chapters by another hand; (3) a few chapters and verses by a third person. The arrangement in the Septuagint differs from that in the Hebrew, and the text is much shorter.

The idea of Jeremiah as "the weeping prophet" comes from the tradition that he was the author of the Book of Lamentations. Much of his prophecy was necessarily of woe because he could see clearly the disastrous course his beloved people were following; yet his assurance of the new covenant was a triumph of faith. His language, although mutilated in transmission, shows his depth of feeling, and such passages as chap. 4, vv. 23-26, still have power to stir the reader.

Bibliography. The Book of the Prophet Jeremiah, L. E. Binns, 1919; Prophecy and Religion: Studies in the Life of Jeremiah, J. Skinner, 1922; J. and the New Covenant, W. F. Lofthouse, 1925; God's Iron, G. A. Birmingham, 1939.

Jérémie. Seaport of Haiti. It stands on the N. coast of the S.W. peninsula, 118 m. W. of Port-au-Prince. Vessels discharge into lighters about a mile from the shore. Coffee, cocoa, hides, and dyewoods are shipped. Here the elder Dumas was born.

Jeréz de la Frontera (formerly XERES). Town of Spain, in the prov. of Cadiz. It stands 8 m. from the sea, and near the river Guadalete, 14 m. direct or 30 m. by



Jeréz de la Frontera, Spain. The gateway of the monastery, built in 1571, restored in 1949

rly. N.N.E. of Cadiz. The town is widely known for the manufacture and export of sherry, the name of which is derived from Jeres, and is surrounded by vineyards, olive groves, holm oaks, and pasture for horses. In the vicinity is a Carthusian monastery, known as the Cartuja and noted for its fine architecture. A Roman colony, Jeréz fell to the Moors in 711, and finally became a Christian possession in 1265. Pop. 92,998. See Sherry.

Jerez de los Caballeros. A town in S.W. Spain, in the prov. of Badajoz, 15 m. N.E. of the Portuguese frontier. The older portion is still surrounded by a Moorish wall. It is the birthplace of Vasco Nuñez de Balboa, discoverer of the Pacific. There are extensive plantations of cork trees in the vicinity. Pop. 14,990.

Jer-falcon OR GYRFALCON (O.H.G. *gir*, Ger. *Geier*, vulture). Species of falcon found in N

Europe, Asia, and America, and occasionally visiting Great Britain in winter. Its plumage is brownish-grey in colour, with the crown of the head very dark. It nests in trees and on the cliffs, and fiercely attacks intruders in the breeding season. See Falcon.

Jericho. Town of Palestine. It lies about 15 m. N.E. of Jerusalem. Frequently mentioned in the Bible, in the days of Christ it was a beautiful city, surrounded with gardens and such an abundance of palms that it was called the City of Palms. It remained a place of importance till the Jewish wars, when it was reduced to ruins. A neighbouring hill being traditionally believed to be the scene of the Temptation, Jericho was regarded as semi-sacred, and was a favourite retreat of anchorites and monks. In the time of the Crusades it contained several monasteries. Excavations at the Khirbet el Mafier palace near by have brought beautiful mosaic paving and other Arab decorations to light.

The modern Jericho, a mere village, is a short distance from the old site. Following the British capture of Jerusalem (*q.v.*) on Dec. 9, 1917, and Gen. Allenby's subsequent defeat of the Turks N. and S. of that city on Dec. 27-30, the right wing of the British army advanced towards Jericho. On the night of Feb. 18-19, 1918, British troops captured the dominating heights of Ras et Tawil, and next morning the main assault developed along the road to Jericho. The town was outflanked, and was evacuated by the Turks. The British entered on Feb. 21. Jericho gave Allenby a base for operations across the Jordan in cooperation with the Hejaz Arab army. In the Arab-Jewish conflict of 1948 the Arab Legion captured Jericho May 15. In Dec. a congress at Jericho invited King Abdullah of Transjordan to become king of Arab Palestine. See Palestine.



Jericho. This ancient town of Palestine is often mentioned in the Bible: the picture shows the modern town, little more than a village, with the valley of the Jordan beyond

Jerked Beef (Peruvian *charqui*). Name applied to beef dried in the sun. The meat is cut into thin strips, after all fat is removed, and hung in the sun for several days. Kept dry, meat can thus be preserved indefinitely. The similarly preserved buffalo meat prepared by the N. American Indians is known as pemmican (*q.v.*). The S. African variety, made from buffalo or antelope, is called biltong. Jerked beef is eaten cooked or raw.

Jerkin (Dutch *jurken*, little frock). Jacket similar to a doublet. See Costume; Doublet.

Jermyn Street. London thoroughfare connecting Regent Street and St. James's Street. Built about 1667, and named after Henry Jermyn, 1st earl of St. Albans, its notable residents have included the 1st duke of Marlborough, Sir Isaac Newton (Nos. 87 and 88), Bishop Berkeley, Thomas Moore, Shenstone, Thomas Gray, Sydney Smith, and Thackeray. The St. James's Hotel, No. 76, was the last London lodging of Sir Walter Scott, 1832.

Jeroboam I. King of Israel, 937-915 B.C. The son of Nebat, he became king after the death of Solomon. Put in charge of the forced labour in Ephraim by Solomon, he attempted a rebellion which resulted in his flight to Egypt. After Solomon's death, Jeroboam placed himself at the head of the N. tribes and was chosen king of Israel. He set up the worship of the golden calf at Dan and Bethel, and so gained the epithet of "Jeroboam, son of Nebat, who made Israel to sin." He fought against Judah, but with little success.

Jeroboam II. King of Israel, 781-740 B.C. The son of Joash, he was chiefly famed as a warrior under whom Israel defeated the Syrians and rectified its boundaries (2 Kings, 14). The conditions of the country under his rule were the subject of the prophecies of Amos.

Jerome (c. 340-420). Saint and Father of the Latin Church. His full name was Sophronius Eusebius Hieronymus. Born of Christian parents at Stridon, on the Dalmatio-Pannonian border, he studied at Rome, where he was baptized by Liberius in 360. As the result of a vision during his travels, he retired to the Syrian desert and, leading an ascetic life, devoted himself to the mastery of Hebrew. In 379 he was ordained at Antioch by Paulinus and studied under Gregory Nazianzen at Constantinople.

Leaving Rome in 385 for the Holy Land, he settled at Bethlehem, where he built a monastery

and a hospital for pilgrims, and died Sept. 30, 420. He translated the Holy Scriptures into Latin (the Vulgate), wrote commentaries and letters, and works on geography and antiquities. He was responsible for the distinction between the Canon and the Apocrypha, and his ascetic example inspired the medieval hermits of S. Jerome or Jeronymites. His works, first ed. by Erasmus, 1516, were edited by Vallarsi, 1734-42. See Vulgate; consult also Life, E. L. Cutts, 1878.

Jerome of Prague (c. 1365-1416). Bohemian religious reformer. He was born at Prague and



Jerome of Prague, Bohemian reformer

educated at the university there. at Oxford, where he came under Wycliffe's influence, and at Paris. He returned to Prague in 1407 and became associated with John Hus (*q.v.*). Arrested for heresy, he was induced to recant, but afterwards withdrew his recantation, and was burnt at Constance, May 30, 1416.

Jerome, JEROME KLAPKA (1859-1927). British author. Born at Walsall, May 2, 1859, he was educated in a London school. Later he was in turn a schoolmaster, an actor, and a clerk in the city of London. In 1885 he published *On the Stage and Off*, an account of his theatrical adventures; but it was with *Three Men in a Boat*, in 1889, that he really made his name.

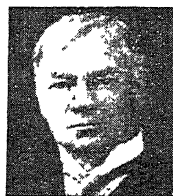
In 1892, having earlier scored another success with *The Idle Thoughts of an Idle Fellow*, he started, with Robert Barr, a monthly magazine called *The Idler*,



S. Jerome, ascetic and translator of the Scriptures

From the painting by Ribera

and in 1893 appeared *To-day*, a weekly which under his editorship had a wide circulation. In 1897



he gave up journalism. As a serious novelist, Jerome made a success in 1902 with *Paul Kelter*, and as a playwright with *The Passing of the*

Third Floor Back, 1907. His other plays include *New Lamps for Old*, 1895; *Wood Barrow Farm*, 1891; *The Prude's Progress*, 1895; and *Miss Hobbs*, 1902.

His later books include *The Second Thoughts of an Idle Fellow*, 1898; *Tommy & Co.*, 1904; *They & I*, 1909; *The Master of Mrs. Chilvers*, 1911; and *All Roads Lead to Calvary*, 1919. His autobiography *My Life and Times* appeared, 1925. He died June 14, 1927.

Jerrican. Container for petrol, fuel oil, or water, used by the forces of both sides during the Second Great War. Recognizing the superiority of the German cans (officially christened jerricans in 1941) over their own, the Allies adopted the German design in 1942. Made of pressed steel, ribbed for strength, the jerrican is rectangular with rounded corners, measuring 18½ ins. by 13½ ins. by 6½ ins. A handle is built in at one of the top corners and a lip, shaped to pour without spilling, at the other; the German containers had an ingenious sealing device, not incorporated in Allied models. A jerrican holds 4½ galls. They were introduced to prevent excessive petrol wastage caused by leaking of ordinary containers.

Jerrold, DOUGLAS WILLIAM (1803-57). British author, dramatist, and wit. Born in London, Jan. 3, 1803, he entered the navy as a midshipman. In 1815 his ship was paid off, and in 1816 he came to London where he was apprenticed to a printer. Studying indefatigably in his spare time, he early began to write, and when about twenty left the printing works. In 1821 his first play, *More Frightened than Hurt*, was produced. In 1824 he married, and in 1825 became salaried writer of plays for *The Coburg Theatre*, and in 1829 for *The Surrey*, where his plays included *Thomas à Becket*, 1828, and *Black-Eyed Susan*, 1829.

Shortly after 1830 Jerrold's plays reached Drury Lane, Covent Garden, and other theatres; they included *The Rent Day*, 1832;

Nell Gwynne, 1833; The House-keeper, 1833; The Schoolfellows, 1835; The Prisoner of War, 1842. Altogether he produced nearly 70 plays, marked by witty dialogue rather than strength of plot.

In 1839 he published pseudonymously *The Handbook of Swindling*. In 1841 *Punch* was started and he was a constant contributor until his death, writing serially *Punch's Letters to Lis Son*, 1843; *The Story of a Feather*, 1844; and *Mrs. Caudle's Curtain Lectures*, 1846, his greatest success. In 1842 he published *Cakes and Ale*; in 1846 *The Chronicles of Clovernook*; and in 1849 *A Man Made of Money*. He edited successively various magazines, notably *Lloyd's Weekly Newspaper*, 1852-57. Whether as novelist or journalist Jerrold always wrote with a strong social purpose and from the standpoint of an advanced Liberal. He died at Kilburn, June 8, 1857.

Jerrold, WILLIAM BLANCHARD (1826-84). British author. Born in London, Dec. 23, 1826, eldest son of Douglas Jerrold, he was educated as an artist but soon turned to literature. In 1851 he produced his highly successful farce, *Cool as a Cucumber*; in 1854, after a journey through Sweden, came *A Brage-Beaker with the Swedes*. In 1857 he succeeded his father as editor of *Lloyd's Weekly Newspaper*, and retained the position until his death, March 10, 1884. He wrote novels, works on Paris life, and on Anglo-Egyptian subjects, but is best remembered for his *Lives of Napoleon III*, 1874-82, and *George Cruikshank*, 1882.

Jerrymander. A less correct spelling of the American political term gerrymander (*q.v.*).

Jersey. Name given to a loose-fitting woollen pullover garment, knitted either by hand or machine. A kind of jersey worn by cricketers and other sportsmen is known as a sweater, and women's garments of this type (sometimes close-fitting) are usually called jumpers; but any kind of knitted pullover is a form of jersey. Garments of this kind in dark blue wool were worn by the fishermen of Jersey before they were popularly adopted elsewhere. A blue and red jersey is part of Salvation Army uniform.

Jersey. Largest of the Channel Islands. The southernmost of the group, 12 m. from France, its area is 45 sq. m. and its pop. 57,133. It is 12 miles from E. to W. and 6½ from N. to S. St. Helier is the capital. There are sailings to Southampton, Weymouth, and St. Malo; also an airport with scheduled air services principally to London and Southampton. The inhabitants are mainly of Norman-French origin. Market-gardening is important; the principal crops are early potatoes and tomatoes for the English market. There is a large export of the famous Jersey dairy cattle, and a very large tourist industry.

The island, divided into twelve parishes, is a favourite resort. The scenery round the coast with its bold rocks, caves, sheltered bays, and old churches, is very picturesque. Mont Orgueil castle at Gorey, and Elizabeth castle at St. Helier, are two of the ancient monuments which are kept in good preservation.

Jersey is governed by committees appointed by an elected body called the states; jurats of the royal court are elected by an electoral college. The chief officers are the lieutenant-gov. (who is also the c.-in.-c.) and the bailiff (president of both the states and the royal court); they are appointed by the crown. The chief ecclesiastic is the dean, and the island is in the diocese of Winchester.

In June, 1940, it was announced that Jersey had been demilitarised, but the island was bombed and machine-gunned by German aircraft before the enemy occupation on July 1. The royal militia of the island had been earlier evacuated and incorporated in the Royal Hampshire Regiment. The German garrison of the Channel Islands surrendered on May 9, 1945, and British troops landed on Jersey on the 12th. Military government ceased on Aug. 25. *See Cattle*; *Channel Islands*.

Jersey, EARL OF. English title borne by the family of Villiers since 1697. It descends from Sir Edward Villiers (d. 1626), half-brother of George, duke of Buckingham. His grandson, another Sir Edward, was a leading man in the time of William III, his advancement being partly due to the fact that his sister Elizabeth, countess of Orkney, was the king's

mistress. He was lord chamberlain and ambassador to Holland and then to France; later he was secretary of state. William made him an earl, but under Anne he became something of a Jacobite. His son, the 2nd earl, was decidedly so.

George (1773-1859), the 5th earl, eloped with the granddaughter of Robert Child, the banker. Since that time each earl has been a partner in Child's Bank and the family name has been Child-Villiers. Victor George Albert (1845-1915), the 7th earl, was paymaster-general during 1889-90, and during 1890-93 governor of New South Wales. In 1923 the title came to George (b. 1910), 9th earl. He married the film actress, Virginia Cherrill. The earl's seat is Osterley Park, Middlesex. When there is an eldest son he is called either Viscount Grandison, an Irish title inherited by the 3rd earl in 1766, or Viscount Villiers.

Jersey City. A city of New Jersey, U.S.A., second largest in the state, 30th in the country, and the county seat of Hudson co. It stands on a headland formed by the Hackensack river and Newark Bay on the W. and the Hudson river and New York Bay on the E., and lies opposite the financial district of lower New York, with which it is connected by the Hudson and Manhattan railway, the Holland tunnel, and ferries. It is a railway centre and port, having a frontage of 11 m. on the Hudson and Upper Bay. The products include toilet articles, cigarettes, brushes, machinery, meat, glass, and chemicals. There are foundries and rly. workshops.

The city partially supports the vast medical centre, with 1,800 beds; and other institutions are S. Peter's College, a state normal school, and the public library. The last houses a superb collection of precious stones. The first organized church and first school in New Jersey were established here, and several relics of the Dutch colonial period remain. Lincoln Park covers about 287 acres. The site of Jersey city, part of which Peter Stuyvesant bought from Indians, was formerly known as Powles or Paulus Hoeck or Hook, after one of the early Dutch settlements, the first being established about 1629. Fortified in 1776 by the Americans, it was captured by the British but retaken in 1779. Incorporated in 1804, it became a separate municipality in 1838. Pop. 301,173.



Jersey arms

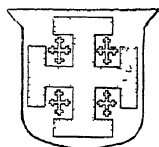


After Sir D. Macnee

JERUSALEM: THE HOLY CITY

* Norman Bentwich, LL.D., and David Le Roi

Three religions—Jewish, Muslim, and Christian—regard Jerusalem as a sacred place, a fact which has accounted for its chequered and stormy history. Its physical characteristics are also described



Jerusalem arms

Jerusalem has been the chief city of Palestine—the Holy Land—for 3,000 years. Its name was interpreted by a Jewish philosopher of antiquity as “the threshold of peace”; and the last part of the name is connected with that root. Its supreme place in the world’s regard is reflected by its Arab name, El Kuds El Sharif, *i.e.* holy, noble place. To Jews, Christians, and Muslims alike it is the holy city, and it is isolated from the commercial as well as the strategic highways.

Poised on the E. slope of the Judean watershed, the city stands 2,000 ft. above the Mediterranean, distant 33 m.; and 3,850 ft. above the Dead Sea, 15 m. away. It occupies a plateau with two southward-pointing spurs bounded by the Hinnom and Kidron valleys. An intermediate ravine, the Tyropoeon of Josephus, with two lateral arms, now almost levelled up, separated the W. from the E. spur. The valleys coalesce near the lower pool of Siloam in a wadi 600 ft. below the plateau level. Of the whole elevated area of 1,000 acres, barely one-fifth lies within the present walls.

The upper cretaceous limestones on which Jerusalem rests made it a city of stone. Their tertiary capping has been denuded, except on Olivet and other outlying hills. The mean temperature is 63° F., the extremes recorded being 112° and 25°. Snow falls about every third year. The annual rainfall, occurring between Nov. and April, is about 20 ins. The rest of the months are virtually rainless. In spring and autumn the dust-laden Hamseen sweeps up from the desert. There is no perennial stream, and the choice of the E. hill for a stronghold was determined by the intermittent Ghion spring at its base. The chief natural resources were fruit-trees, especially olive, fig, and vine. The Muslim ban upon wine caused the uprooting of most of the ancient vineyards. The cultivation of barley and other cereals as well as of garden produce is limited. Wheat is still procured, as of old mainly from the lower plains.

The early occupation of the Judean plateau is proved by numerous flint implements of palaeolithic type. Pottery finds on the eastern hill of Jerusalem attest a pre-Semitic settlement before 2500 B.C. There are some dolmenic tombs and other remains of the megalithic civilization.

The eastern hill became a fortified town, first mentioned in seven letters, part of the Amarna correspondence, written about 1400 B.C. by Abdikhiba of "Urusalim," to his Egyptian overlord Amenhotep III. Some scholars think that there is a reference to the place in the name Awsamm, which appears on a potsherd of about 2000 B.C. Whether the Habiri, reported in the Amarna letters, were the Hebrews led by Joshua depends upon the identification of the Pharaoh of the Exodus, which is still disputed. The city remained Canaanite, a Jebusite fortress, till about 1000 B.C., when it was captured by David and made the chief city of his kingdom.

Jerusalem's subsequent history is broadly divisible into three

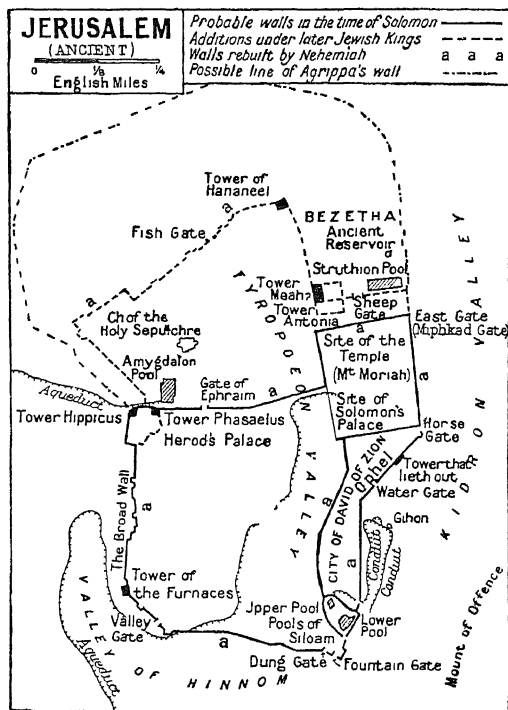
approximately equal periods. During the first the city of David was Jewry's national centre, and for one half the term lay under tribute to other powers, Egypt and Assyria, Babylon and Persia, the Seleucids and the Ptolemies, Rome and Parthia. This was the era of the temples of Solomon, Zerubabel, and Herod, the era of the Jewish nation, as recorded in the Bible and the works of Josephus. It closed with the destruction of the city by Titus in A.D. 70.

When Hadrian rebuilt Jerusalem in 135, renaming it Aelia Capitolina, he forbade the Jews to enter on pain of death. This second period witnessed the rapid growth of the city in the regard of Christendom. Pilgrims began to flock to it. Constantine ordered a search for the holy places in 326. Churches were erected.

Recent excavations on Mount Ophel, the eastern hill, outside the present walls, have revealed Byzantine occupation in the 5th and 6th cent. The city was captured by the Muslim Arabs under the Khalif Omar in 637; but Christians and Jews were allowed to inhabit it. On the site of the Jewish temple rose the Muslim shrine, the dome of the rock, built by the Sultan Abdul Melik and inaccurately called the mosque

of Omar. It is an octagonal shrine surmounted by a dome, which covers the traditional altar of burnt offering on Mount Moriah. Its interior decoration and its external fabric of glazed tiles give it a singular beauty. The mosque of El Aksa, which is also on the site of the temple, was adapted out of a basilica of Justinian at the end of the 7th century.

The arrival of Godfrey of Bouillon in 1099, at the head of the Frankish crusaders, inaugurated the Latin Christian kingdom, which endured till Saladin recaptured the city in 1177. The



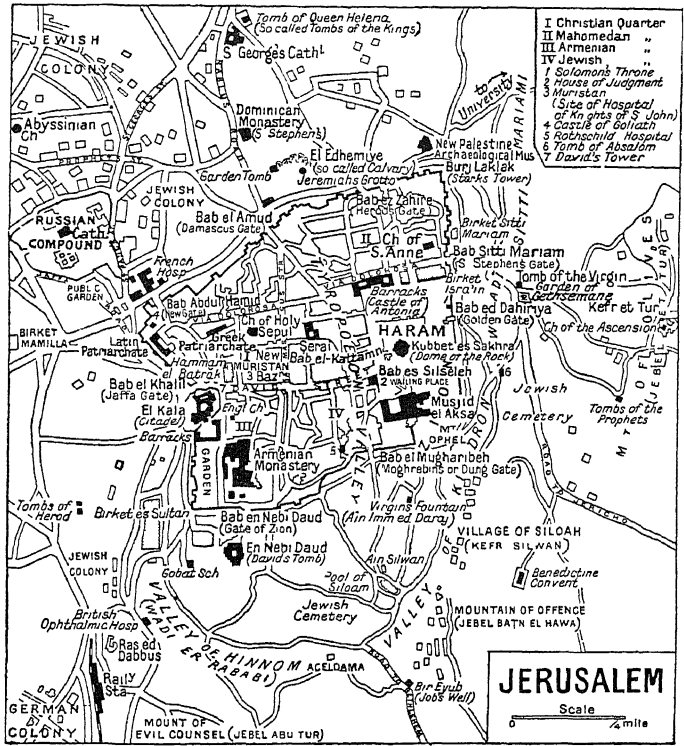
Jerusalem. Plan of the ancient city, indicating its size at various epochs

third phase, that of Islam's restored domination, culminated in the Ottoman occupation under Selim I (c. 1500), and the erection by his son, Suleiman the Magnificent, in 1542 of the present walls. This period ended with the surrender of the city to British forces under Gen. Allenby on Dec. 9, 1917 (*v.i.*).

Remote from the greater arteries of W. Asian trade, the city's industrial life never acquired more than local importance. Its handicrafts were exchanged with neighbouring villages; olive oil alone attained exportable value. Wealth flowed in from the tribute paid to rulers and priests, and the expenditure of pilgrims. In the middle of the 19th cent., following the occupation of Palestine by the Egyptian forces of Mohamed Ali, the pop. began to grow, and religious foundations of the principal European powers were multiplied. The Russians, the protectors of the Orthodox church, to which the largest part of the Christian pop. belonged, built pilgrim hostels, hospices, and churches in the suburbs of the walled city and on the Mount of Olives. Then came the French and Italians, the upholders of the R.C. church. Following the visit of the German emperor in 1899, four big German hospices and churches were founded. The English had only a modest cathedral and a few schools. At the same time archaeological excavation to trace the past was introduced, the British-Palestine exploration fund giving the lead.

Small suburbs of agricultural colonists were planted by the German Templars society and by American-Swedish groups. The Jewish pop. coming from E. Europe was also settled in modern quarters outside the walls. Even before the First Great War, the Jews constituted the majority of the population.

After the British civil administration was constituted in 1920, the city grew rapidly, and at the end of 1946 the pop. was 164,330 (99,320 Jews; 33,680 Muslims; 31,330 Christians). A new city, entirely modern in character, has grown up on the hills to the N., W., and S. The royal commission which reported on Palestine in 1937 marked the contrast between the old and the new: "On the slope rising westwards from the old city, still a tangle of narrow streets and dark arcades, still indomitably Asiatic, has spread a suburb of modern stone-built villas



Jerusalem. Plan of the modern city showing the holy places and the historic landmarks of Christendom, Islam, and Jewry

and flats and shops, centred round the massive fortress-like headquarters of the Jewish agency."

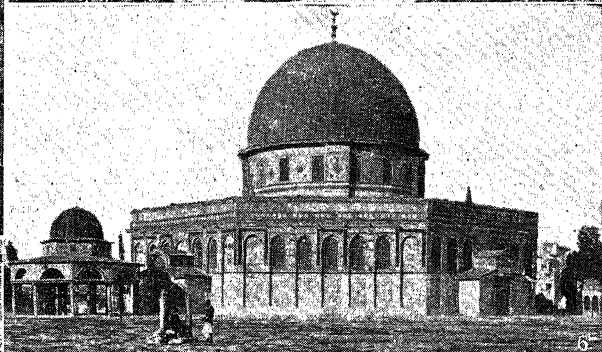
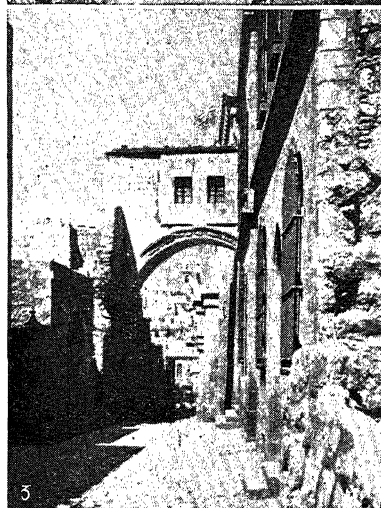
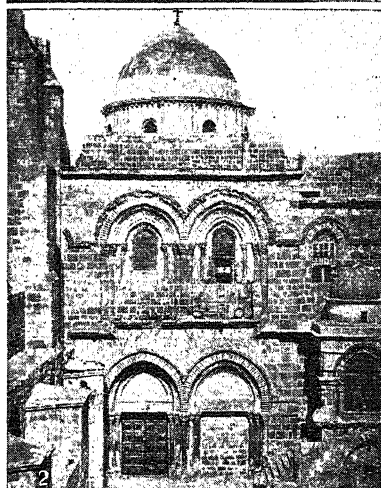
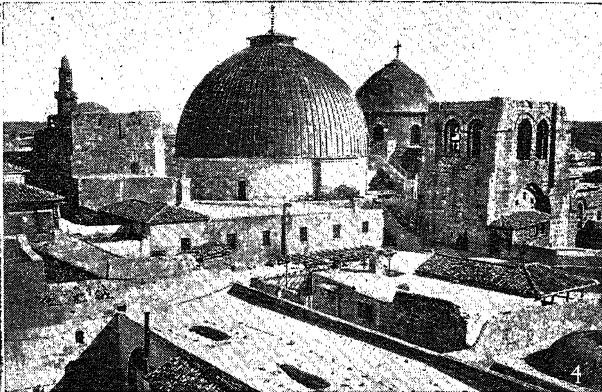
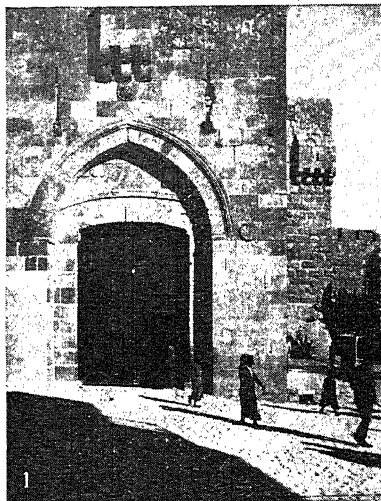
The Christian quarter of the old city includes the church of the Holy Sepulchre. Erected by Constantine in 335, it was, after various reconstructions, surrounded during the Latin kingdom by an Augustinian monastery, and after a fire in 1808 was restored under Greek influence. Within the Jaffa gate on the W., upon the foundations of Herod's palace-tower of Phasael, stands a Crusader structure, dating from the 14th century, usually called David's tower, from a tradition which located Sion on the W. hill. The sacred places associated with the life of Christ have been localised by long tradition. The site of Calvary and the Tomb has been the object of controversy almost from Constantine's day, owing to the difficulty of reconciling it with the place of crucifixion outside the city wall.

* Norman Bentwich

CAPTURE OF JERUSALEM, 1917. During the First Great War the fall of Jerusalem to the British was the culminating point of their campaign against the Turks in Palestine (*see* Palestine, Campaign

in). Towards the close of Oct., 1917, Gen. Allenby began to advance on Jerusalem from his base at Ramleh, about 25 m. distant. By Nov. 18, his cavalry had occupied Beit-Ur-el-Tahta, 12 m. away on the northern road from Jaffa. Next day the main body of British infantry advancing from Ramleh along the S. road to Jerusalem captured Amwas and Latron, and on Nov. 20 reached Kuryet-el-Enab, 6 m. away. To avoid fighting in close vicinity to the sacred places, the infantry wheeled N. to Bireh, in which direction the cavalry were advancing from the W. On Nov. 21 the infantry captured Nebi Samwil ridge. At that time the cavalry was within 2 m. of Bireh; but on November 22 the Turks, recently reinforced, launched a strong attack and forced the mounted troops back 3 m. to Beit-Ur-el-Foka; an attack against the infantry on Nebi Samwil ridge was repulsed and the ridge held.

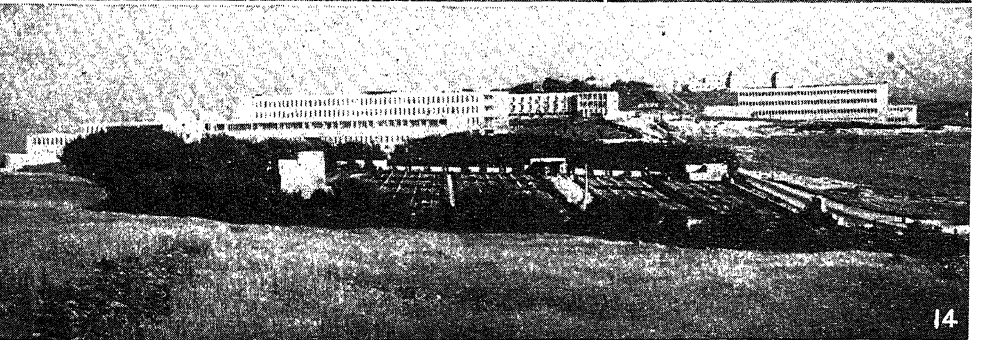
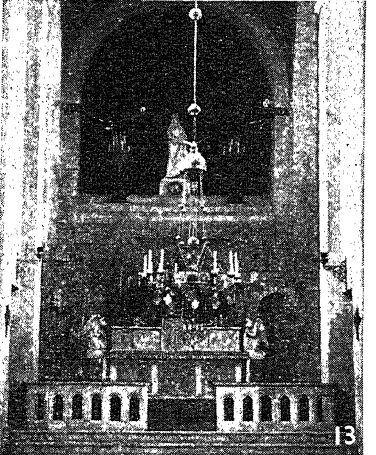
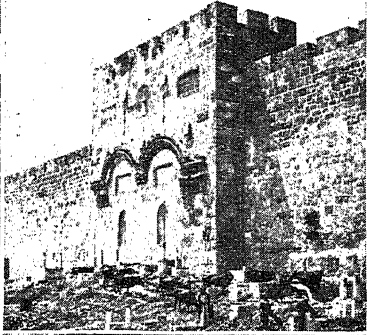
Following an unsuccessful British counter-attack on the night of Nov. 23-24, Allenby decided to pause while his engineers extended the rly from El Kantara through Gaza to his front and built roads for his artillery in the conquered



1. Outside the Jaffa Gate. 2. Façade of the church of the Holy Sepulchre. 3. Via Dolorosa, with the Ecce Homo Arch. 4. Church of the Holy Sepulchre seen from

adjoining roofs. 5. Tower of Hippicus, in the old city walls. 6. Dome of the Rock or Mosque of Omar on the site of Solomon's temple. 7. Gate of S. Peter's prison

JERUSALEM: SOME NOTABLE LANDMARKS OF THE HOLY CITY



8. Jews' Wailing Wall. 9. Stairway leading to the Holy Sepulchre. 10. View of the old city and Mount of Olives. 11. 7th cent. Golden Gate, closed by Arab

in the year 810. 12. Outside the Damascus Gate. 13. Interior of Ecce Homo arch, now the choir of a Christian church. 14. Hebrew university, Mt. Scopus

district. In the meantime his troops were successful in a number of local engagements at Nebi Samwil El Burj and Upper Beth Horon. Hebron was occupied without opposition by the 53rd (Welsh) div. on Dec. 6.

Allenby fixed Dec. 8 for the final assault on Jerusalem, and despite bad weather the first objectives were carried in an encircling movement from the N., S. and W. The following morning the British were $1\frac{1}{2}$ m. from Jerusalem, which the Turks had evacuated the previous night. That afternoon the mayor of Jerusalem appeared at the British h.q. with a letter from the Turks surrendering the city. Two days later Allenby made his official entry into Jerusalem on foot, ending 375 years of Muslim rule of the city.

On the night of Dec. 26-27 the Turks made four separate attempts to retake Jerusalem, but were driven back. The capture of Bethel on Dec. 30, 1917, ended any further Turkish attempts at recapture.

BRITISH OCCUPATION. Important works carried out in Jerusalem were the laying of new pipe lines for water supply, the transformation of the sanitary system, and the provision of electric power stations. On the cultural side the most notable achievements were (1) the Palestine museum of archaeology, presented by John Rockefeller, Jr., a beautiful building outside Herod's Gate, and a fitting treasure-house of Palestinian antiquities; and (2) the Hebrew university, of which the foundation stones were laid in 1918 on a magnificent site on Mount Scopus. The university buildings, which have grown up since 1925, include a hospital and medical research centre, an institute of the humanities, institutes of chemistry, physics, and mathematics, a museum of archaeology, the university and national library, and departments and museums of botany, zoology, and geology. In the renaissance of Jewish national life, Jerusalem has become an important centre of culture.

On the other hand, after its liberation from the Turks Jerusalem was the scene of outrage and rioting arising from the rivalry of Jew and Arab, and later from the Jewish hostility to British limitation of Jewish immigration into Palestine. Riots occurred in 1920 and in 1929 over incidents at the wailing wall. Bomb outrages marked the Arab anti-British revolt of 1936-39; while after the Second Great War

Jewish illegal organizations perpetrated terrorist outrages. An outstanding incident of this period was the blowing up on July 22, 1946, of part of the King David hotel, which housed British military h.q. in Palestine and the offices of the govt. secretariat; 91 were killed, including Arabs and Jews. An order was made for the evacuation of British women and children, Jan. 31, 1947. In the U.N. proposals, Sept., 1947, for the partitioning of Palestine, Jerusalem was given a special position as an autonomous city, with the holy places accessible to all.

ARAB-JEWISH CONFLICT. With the ending of the British mandate, May 15, 1948, the new Israeli govt. claimed Jerusalem as its capital; but the invading Arab Legion swiftly reached the city and besieged the Jews in the old city. The Jewish forces, however, succeeded in opening a road from Lydda to Jerusalem, and this remained in their hands during the ensuing truce. Cease-fire agreements were frequently broken in Jerusalem, and it was here that Count Bernadotte, the U.N. mediator, was assassinated by Jewish terrorists, Sept. 17. In his report

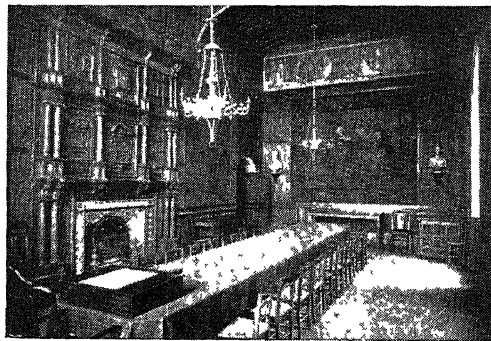
Jerusalem. British song, the music by Sir Hubert Parry to words from Blake's poem, Milton. It was named on account of its last two lines: "Till we have built Jerusalem in England's green and pleasant land." First performed at a suffragist meeting at Queen's Hall, London, March 28, 1916, it was frequently sung in schools, was adopted by the National Federation of Women's Institutes, and further popularised by broadcasting.

Jerusalem, SYNOD OF. A religious legislative assembly summoned by Dositheus, patriarch of Jerusalem, in 1672, for the defence of the orthodoxy of the Eastern Church. Under its auspices was issued The Shield of Orthodoxy, March 20, condemning especially the views attributed to Cyril Lucar, and containing a full confession of the Orthodox Greek Faith. See Greek Church.

Jerusalem Artichoke (*Helianthus tuberosus*). Edible vegetable of the sunflower family (Ital. *girasole*, sunflower). See Artichoke.

Jerusalem Chamber. Hall which was formerly the abbot's guest room and is now part of the deanery of Westminster Abbey.

Built by Abbot Littleington, about 1380, it is beautifully panelled in cedar, and is supposed to derive its name from tapestries illustrating the history of Jerusalem by which it was once adorned. The existing tapestries are of early Stuart date. Part of the arcade of the ancient high altar is preserved here, and



Jerusalem Chamber, Westminster Abbey. It was formerly the Abbot's guest room

to the U.N., he had proposed that Jerusalem should be placed under U.N. control. Israel at first appeared to favour this suggestion, but when in 1950 the U.N. trusteeship council passed a statute for the internationalisation of Jerusalem the Jews received it with hostility and the Arabs with reluctance. The first meeting of the constituent assembly of Israel took place in Jerusalem, Feb. 14, 1949.

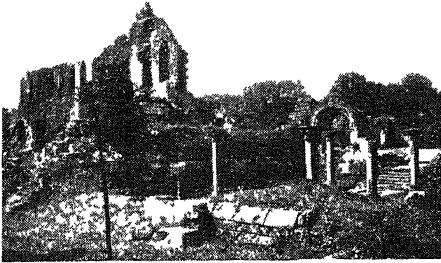
During the fighting in 1948 the Jewish quarter of Jerusalem was damaged, but the holy places only slightly affected.

See Crusades; Holy Places; Israel in N.V.: Palestine; Siloam; Wailing Wall.

there is a portrait of Richard II, ascribed to Beauneven of Valenciennes. The windows contain remnants of painted glass, all but one in the N. window being of 13th century date. The chamber was restored by Dean Williams in the reign of James I. Here Henry IV died in 1413, Sir Thomas More was confined in 1534, the Westminster Assembly met in 1649, and the revisers of the Bible assembled in 1870, as did the upper house of Convocation before 1896. Regalia are brought here on the eve of a coronation. See Westminster Abbey

Jervaulx, YOREVALE, OR UREVALE. Hamlet of the N. Riding of Yorkshire, England. It is 13 m.

N.W. of Ripon and is famous for the ruins of its Cistercian abbey. The Ure flows past it, and about here Wensleydale begins. The abbey was founded in 1156 by monks from Byland, and was dissolved at the Reformation, Adam Sedbergh, the last abbot, being hanged in 1537 for his share in the Pilgrimage of Grace. An earlier abbot is mentioned in Ivanhoe. The remains are chiefly in the



Jervaulx. Ruins of the abbey buildings; in the foreground are remains of the chapter house
Frith

vicinity of the chapter house, while the ground plan of the whole can be traced.

Jervis Bay. Harbour 82 m. S. of Sydney, Australia. An area 2 sq. m. on its S. side is used by the federal government as a port for Canberra. It has steam communication with Sydney. The bay is enclosed by Point Perpendicular and Cape St. George, headlands which project far beyond the general coastline.

Jervis Bay. A British armed merchant cruiser which figured in a celebrated action of the Second Great War. On Nov. 5, 1940, a westbound convoy of 32 ships of various nationalities was attacked in the N. Atlantic by the German pocket battleship Admiral Scheer. She opened fire at a distance of 10 m. and the destruction of the convoy appeared imminent. Capt. E. S. F. Fegen, R.N., of the escorting ship Jervis Bay, showing superb devotion to duty, at once decided to sacrifice his ship to save the others. He engaged the enemy, while the commodore of the convoy ordered all ships to drop smoke floats and scatter.

The Admiral Scheer was an armoured ship of about 14,000 tons, mounting six 11-in. and eight 5.9 in. guns. Her speed was 26 knots, ten knots faster than the Jervis Bay, a former Aberdeen and Commonwealth liner of 14,164 tons, built in 1922, which carried a few 6-in. guns of an obsolete model, and no armour. Yet for three hours the Jervis

Bay kept up the unequal fight when she sank, a blazing wreck, darkness had fallen. In consequence only six ships out of the convoy were sunk, totalling 38,720 tons. Casualties were severe, for only a few boats and rafts got away from the lost ships; Capt. Olander of a Swedish ship in the convoy proposed to his crew in the night that they should return to look for survivors, of whom they picked up 65. Fegen was awarded a posthumous V.C.

Jesi. City of Italy, in the prov. of Ancona. The ancient Aesis, it stands on the left bank of the Esino, 16 m. by rly. S.W. of Ancona. It has a 15th century castle, a stately cathedral, and a handsome town hall containing fine paintings. The town manufactures silk, soap, and paper, and carries on a trade in wine, oil, corn, and cheese. It was the birthplace of the emperor Frederick II. Pop. 23,600.

Jesmond. District of Newcastle-upon-Tyne, England. It has a railway station, and it is connected by trams and buses with the centre of the city. To the N.E. of the city, it is a residential suburb. Jesmond Dene, a beautiful glen, was presented to the city by Lord Armstrong. The name was originally Jesus Mount, and it was formerly a place of pilgrimage. It had a hospital dedicated to the Virgin, and some remains of the pilgrimage chapel can still be seen. See Newcastle-upon-Tyne.

Jesse. Biblical character, known only as the father of David. He is described as a native of Bethlehem, and had seven sons, in addition to David (1 Sam. 16). He is regarded as the first person in the genealogy of Jesus Christ. A Jesse tree is a representation, in the form of a genealogical tree, showing the descent of Jesus Christ from Jesse. They are frequently found on stained-glass windows called Jesse windows; a notable example is in the abbey church at Dorchester, Oxon, and there are others in the cathedral at Amiens, Chartres, and Wells. The word, still used as a Christian name, means in Hebrew The Lord is. The feminine Jessie and Jessica are contractions of Johanna.

Jessel, Sir George (1824-83). British lawyer. The son of a Jewish merchant, he was born in London,



Sir George Jessel,
British lawyer

Feb. 13, 1824, and educated at a school for those of his faith. He took a degree at London university, and became a barrister in 1847. In 1868 he entered parliament as Liberal M.P. for Dover, and in 1871 was made solicitor-general. Master of the rolls from 1872 until his death, March 21, 1883, he was also president of the court of appeal from 1881. Jessel was the first Jew to be made solicitor-general, a judge, or a privy councillor. He had a good deal to do with judicial changes made by the Act of 1873 and other Acts. A master of legal intricacies, he was never known to reserve judgement.

Jesselton. Town of British N. Borneo. It stands on the W. coast, on the S. China Sea, about 140 m. W. of Sandakan. From this administrative and commercial centre a rly. runs to Melalap in the interior, with a branch from Beaufort to Weston.

Jessica. Character in Shakespeare's comedy The Merchant of Venice (*q.v.*). The daughter of Shylock the Jew, she dressed as a page to elope with the Christian Lorenzo.

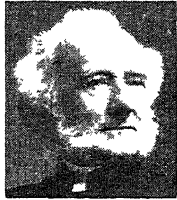
Jessop, Gilbert Laird (b. 1874). English cricketer. Born at Cheltenham, May 19, 1874, he was educated at Beccles College, and Christ's College, Cambridge. In 1896 and 1898 he played cricket for the university against Oxford: in 1899 he led the team. Afterwards captain of Gloucestershire, he played for England against Australia in four seasons at home and in Australia 1901-02. His century at the Oval in 1902, which won an apparently impossible victory, has been called the greatest innings ever played in a test match. He was renowned for his hitting powers; some of his finest innings were concentrated into a few minutes, and in the Gentlemen v. Players match of 1907 he scored 191 in 90 minutes. Four times he made a century in each innings of a match. A superb fieldsman at extra-cover, he was one of the



Gilbert L. Jessop,
English cricketer

fastest bowlers of his time. In 1900 he exceeded 2,000 runs and 100 wickets. Jessopp wrote *A Cricketer's Log*, 1922; *Cricket and How to Play It*, 1925.

Jessopp, Augustus (1824–1914). British author and divine. Born at Cheshunt, Dec. 20, 1824,



Augustus Jessopp,
British author
Elliott & Fry

he was educated at S. John's College, Cambridge, and was a curate in Cambridgeshire. In 1855 he was made headmaster of Helston grammar school, and from 1859 to 1879 was head of King Edward VI school, Norwich. Rector of Scarning, Norfolk, 1879–1911, he was also chaplain to the king and honorary canon of Norwich. He died Feb. 12, 1914. Jessopp studied the past of East Anglia, and, possessing a delightful style, in a quiet way contributed a good deal to historical knowledge. His best work is perhaps in *The Coming of the Friars*, 1888. Other books are the semi-historical *One Generation of a Norfolk House*, 1878; *Arcady, for Better for Worse*, 1887, a clear presentation of East Anglian life; *England's Peasantry*, and *Other Essays*, 1914.

Jessore. District and town of Pakistan, in East Bengal. Its area of 2,925 sq. m. is about two-thirds cultivated, mostly under rice. The exports include rice, jute, and hides; the imports are salt, oil, and piece goods. Jessore is served by rly. from Calcutta. Pop., dist., 1,828,216; town, 9,530.

Jest Book. Collection of humorous stories or witty sayings. The earliest known English example is *A Hundred Merry Tales*, printed about 1525 by John Rastell. The early jest books were frequently described as *geste* books, or books concerning the deeds of famous persons. With the gradual acceptance of the spelling *jest*, the word came to denote practical jokes and then ludicrous things generally. Many jest books, largely associated with individuals—Tarleton, Peele, and others—were issued within a century of the first. The vogue of the jest book grew and it became more and more a miscellaneous collection of *bons mots*, repartees, and brief anecdotes. Specially famous were Joe Miller's *Jest Book*, 1739, and Mark Lemon's *Jest Book*, 1864. See *Gotham*.

Jester. Retainer attached to royal or noble households in medieval and later periods, and supposed originally to have been a teller of stories or *gestes*. The term came to be applied more particularly to one who was also known as the court fool, and was privileged by his supposed foolishness to utter sharp things without having to suffer for it. The custom of keeping such a retainer is of ancient date; Philip of Macedon and Attila are said to have kept fools or jesters.

In England the jester appears to have been known in Saxon times, the earliest known being Hitard, who performed to Edmund Ironside. Goles, court fool to William the Conqueror, is said to have been the means of saving his master's life. Rahere, "joculator" to Henry I, founded S. Bartholomew's Hospital. Will Somers was jester to Henry VIII, and Archie Armstrong to James I and Charles I. Sir Pexall Brocas (d. 1630) and a 17th century Lord Suffolk

are variously said to have been the last private persons in England to keep a jester. The English jester wore a motley or parti-coloured dress, with a cap to which were attached asses' ears or bells, and carried a bauble or stick with carved head or bladder at the end.

French court jesters are the 14th century Thévenin de S. Leger; and, 15th–16th centuries, Caillet, Triboulet, and Chicot. Triboulet, mentioned by Rabelais, is the hero of Hugo's romance *Le Roi s'Amuse* and of Verdi's opera *Rigoletto*; while Chicot is presented in Dumas's *La Dame de Monsoreau*, Eng. trans. *Chicot the Jester*. In the East the office was very old; it is referred to in the Ramayana, and many stories are recorded of Bahalul, jester to Haroun al-Raschid. In the far west, the Mexican Montezuma is said to have had a jester at his court. See *Fool*; *consult History of Court Fools*, J. Doran, 1858.

JESUITS: THE SOCIETY OF JESUS

Rev. C. C. Martindale, S.J.

This article tells the history and explains the aims of the order. See biographies of Loyola; Xavier, and other leading members; Jansen; Jansenism; Pascal; Port-Royal; Reformation. See also Missions; Papacy; Roman Catholic Church

The Society of Jesus, a religious order whose members are commonly called Jesuits, was founded in 1534 by S. Ignatius of Loyola. He and his friends had not meant to found a religious order, but to convert Mahomedans; nor did Ignatius foresee any specific work such as a counter-Reformation or education. For greater freedom, he adopted no special dress, dispensed with choir, forbade the acceptance of ecclesiastical dignities, and finally got his society recognized as a "mendicant order of clerks regular," i.e. clerics living on alms and under rule. Ignatius had wished to dispense also with rules, trusting to the Holy Spirit and mutual charity to hold his men together; but, as numbers grew, after much prayer he drafted constitutions which have never been changed since their adoption in 1558. The rules do not bind under pain of sin; should a superior command what was sinful, a subject would be bound to disobey.

The general congregation elects the general, the superior set over the society as a whole. He can act only within the constitutions, but within these has executive and spiritual authority. The general congregation is composed of this

general, his assistants (who transmit to him the business of a group of provinces), provincial superiors with two delegates elected within each province, and a few others. The general congregation elects and could depose (this has never happened) the general whose task, therefore, is to preserve and develop but not to revolutionise. He alone has a life office.

Applicants for membership mean either to become priests, or to be "brothers-coadjutor" (lay brothers) and help in the material work of the society's houses. All make a novitiate of two years' spiritual training which concentrates on the study of the great religious truths and the example of our Lord, aiming at union with the will of God through love for and union with Christ and the courageous abdication of self-love and self-deceit. A hard life under experienced direction, a daily hour of meditation and other prayer (no one method of which is exclusively imposed), retreats of which one lasts 30 days, help towards deepening the spiritual life, emancipating it from impulse and moodiness, and encouraging a constant effort towards what is positively the better, not mere abstinence from what is wrong. After the

noviciate "simple vows" of poverty, chastity, and obedience are taken; as a rule, those who are not to be lay-brothers study classics and mathematics for two years and science and philosophy for three; they then teach in some college for three to five years and study theology, after three years of which they are ordained (aged about 33); they then do a fourth year of theology. A third year of spiritual training follows; after which they take their final vows, some taking "solemn" vows, and adding other "simple" ones, *e.g.* of special obedience to the pope, should he require them *e.g.* to go to foreign missions; to refuse ecclesiastical dignities, except to become a bishop in such missions by the pope's order—a position simply involving extra work and no emoluments. These are the "professed (of the four vows)" and form the nucleus of the society.

Educational Methods Opposed

The society, unchanging in structure but flexible in method, was not scared by or hostile to the Renaissance, but wished to exorcise its paganism. The older orders sometimes resented this upstart society whose vitality shocked them. Thus the Jesuits' schools and colleges, and their thronged university courses, earned the jealousy of old-established centres, not least of Paris university. Their successes in controverting the early Protestants led some of the latter to assert that they used black magic; were wholesale poisoners. Their combating of the Lutheran and Calvinist doctrines of the complete corruption of human nature caused them to clash with the Baianists and then the Jansenists who on their side accused the Jesuits of a Semi-Pelagian heresy making the will self-sufficient for salvation.

The spirit of nationalism in Spain almost at once endangered the unity of the society. Rodriguez, one of the first "companions," introduced customs in Spain somewhat different from Ignatius's own uncompleted discipline: the Spaniards leaned more to penance and mystic prayer than Ignatius did; also they desired a separate government for Spain.

In days when religion entered into all politics and wars, no one, priest or not, could stand wholly aloof. Thus when the League (*see* France: History) was formed in 16th cent. France to protect the church against the Protestant heir to the throne, Henry of Navarre, Jesuits were involved on both sides.

The parliament, which had been pro-League extremist, tried to make the society responsible for the attempt on Henry's life, 1594. A. Arnauld (*see* Pascal) made a fierce attack on it, and it was expelled from France, Henry however brought it back, 1603. His assassination, 1610, was the occasion of further anti-Jesuit feeling.

Success in Foreign Missions

The society prospered despite its criticism of Richelieu's support of German Protestants against Catholic Austria. Foreign missions developed rapidly, converts in India becoming numerous, especially after Robert de' Nobili began to live as a Brahmin. Concessions to local customs occasioned the controversy over Malabar rites, regrettably condemned in 1744. Missions in Abyssinia and on the Zambesi were short-lived; but in 1700 a mission in Persia numbered some 400,000 Christians. The Japanese mission had made about 1,800,000 converts by 1600, but was hindered by rivalries between Spain's emissaries and those of Portugal, and other difficulties. Many members of this society were martyred in China; the S. American missions have had lasting influence on the development of Latin America.

In 1759 the society was suppressed in Portugal with extreme brutality. In France, Louis XV, after resisting the demand for its extinction, sulkily abolished it in his dominions in 1764. The other members of the Bourbon "family compact"—Spain, Naples, Parma, etc.—followed suit, exercising pressure on Clement XIV until, after delaying as long as he could, he suppressed the society in 1773 by an administrative, not a judicial, act, lest a schism such as that started in Portugal should become general. Frederick II of Prussia and Catherine of Russia forbade the publication of the brief, and in their domain the society continued to exist and educate; elsewhere its members lived as secular priests in various conditions. The politicians' essential objection to the society was its disavowal of the theory of divine right, and therefore of the absolute authority, spiritual or temporal, of monarchs. Little by little, the holy see re-established the society, the restoration being completed by Pius VII, 1814.

So brief an article as this can neither substantiate nor disprove the more serious charges against the Jesuits. Among books which created the "legend" may be cited Zahorowski's *Monita Secreta*,

1614, refurbished in the early 19th cent., A. Dumas's *Twenty Years After*, 1845, and especially E. Sue's *The Wandering Jew*, 1844. The misinterpretation of the formula "The end justifies the means" as signifying "Do evil that good may come" has also contributed. This is not a theological formula at all, but states the principle that an act derives a moral quality not only from its intrinsic nature or the means taken to carry it out, but from the end for which it is done, and could equally well be stated—"The end (*i.e.* if bad) vitiates the means (*i.e.* if in themselves neutral)." Thus a morally neutral act (visiting a hospital) can derive a moral value, good or bad, from the end envisaged (cheering a sufferer: poisoning him). "Blind obedience" is an immemorial expression inherited, not invented, by Ignatius; and his writings and the history of the society show that he, and it, desire the maximum of intelligent alertness and personal activity in its members, and even Jesuit "discipline" is not so strict as that within any army or a political party which forbids members to vote otherwise than as the party decrees. When the society was suppressed, its archives were seized, but nothing was found to substantiate the charges made against it. The society possibly shared to some extent not only in the decline of "first fervour" associated with days of creative enthusiasm, but also in the decadence of the 18th century, and perhaps it may have been satisfied too easily with the second rate.

Famed for Scholarship

Its earlier successes were chiefly in theology and philosophy, but its members have always done well in mathematics and the sciences, not least in astronomy, rather than in pure literature. It has also produced historians of repute. At the beginning of 1947 the entire society numbered 14,372 priests; 9,279 scholastics (students); 5,188 brothers. The English province then numbered 547 priests; 196 scholastics; 116 brothers; it has missions in S. Rhodesia, and the Cape province, S. Africa, and in British Guiana. *Consult* Ignatius Loyola, D. W. Sedgwick, 1923; *The Origin of the Jesuits*, James Brodrick, 1940; *The Progress of the Jesuits, 1556-79*, James Brodrick, 1946.

Jesuit's Bark. Synonym for cinchona (*q.v.*). Traditionally, the first to prescribe cinchona bark for fever was a Jesuit priest.

JESUS: HIS EARTHLY LIFE & MINISTRY

This article deals with the factual aspect of the personal life of Jesus, leaving to the article Christianity the history of the church he founded. The problems arising out of his life and death are dealt with under Atonement; Christology; Incarnation; Resurrection; Virgin Birth, etc., while there are illustrations with the articles on Caravaggio, Doré, and other artists. See also Gospels

The name of Jesus was common enough in Israel, for it is the Greek form of Joshua, the hero who led Israel into Canaan, and the root of it signifies salvation. But it now means for the world one person, and one alone. The date of his life is easy to remember, because we reckon time by it; we divide the centuries of history into those before he was born and those which have elapsed since. Some scholars have suggested Oct. 5 in the year now called 4 B.C. as the correct date of birth. Traditionally it was at Bethlehem, Judea, about 5 m. S.W. of Jerusalem, that Jesus entered the world.

All that we know of Jesus's life is contained in four brief documents called Gospels (i.e. good news). Mary, the mother of Jesus, described his birth. An angel came and said, "The Holy Ghost shall come upon thee and the power of the Most High shall overshadow thee, wherefore also that which is to be born shall be called holy, the Son of God."

The First Thirty Years

Accordingly, when the boy at 12 achieved the status of manhood, he explained to his mother, and to Joseph, who had brought him up from infancy, that he was bound to be "about his Father's business," for he was conscious that he had been sent into the world from God to accomplish a specific work. For 18 years, however, after that announcement he lived in complete obscurity at Nazareth in Galilee, working as a carpenter; and, after the death of Joseph, in all probability supported, as head of the family, his mother and brothers and sisters. But the emergence of his cousin John as a prophet called him out of his retirement. He was baptized in the Jordan, and there fully realized the mission to which he was called. He was the Christ that Judaism expected, he was to be the Saviour of the world in the way foreshadowed by a prophecy in a book of the exile, Isaiah 53.

Gathering around him a few young disciples, he began at Capernaum on the Lake of Tiberias in Galilee a ministry of teaching and healing. The Kingdom of God was coming, in parables that

arrested attention and aroused curiosity, he described the nature of that rule of God on earth which he had come to inaugurate; at the same time the divine mercy showed itself in him, restoring the diseased, feeding the hungry, raising the dead. People were drawn to him in multitudes wherever he went.

His teaching was summed up in what we know as the Sermon on the Mount; he spoke as one having authority, and not as the scribes. But the freshness, independence, and power of his message and work brought him speedily into collision with the religious authorities of his people. The priestly rulers, known as Sadducees, the interpreters of the Mosaic Law, the scribes, and the party of piety, the Pharisees, resented his disregard of their minute regulations, especially those for the observance of the Sabbath. Their system did not admit of originality. Though it was supposed to stereotype an ancient revelation of God, it was so stiffened, so hidebound, so arid and brittle, that the living truth of Jesus was fatal to it, like the ferment of new wine in old leathern bottles. Thus the Jewish authorities, realizing that Jesus would inevitably expand Judaism into a religion for the world, and so destroy the distinctive privileges of the ancient system, from the early days of the new ministry resolved to put Jesus to death.

Jesus recognized that only through death, which man in this way would inflict upon him, could he accomplish his work; the seed must fall into the ground and die in order to live. He made it a practice to go up to Jerusalem for the stated Jewish festivals, and visiting it for the Passover in the third year of his ministry, he was conscious that he went up to die. The raising of Lazarus from the dead, and the resolute cleansing of the defiled Temple brought matters to a crisis. By the treachery of a

disciple, Judas Iscariot, Jesus was quietly arrested after praying at Gethsemane, an illegal trial was hurried through in the night; and on the morning of the Paschal Feast the authorities of Judaism demanded from Pontius Pilate, the Roman procurator, that he should authorise the crucifixion of their victim. The Roman's sense of right at first resisted this injustice but a threat to denounce him to his jealous and suspicious master, the emperor Tiberius, at Rome, forced him to agree. Jesus was crucified on Mt. Calvary. The date of April 7, 30, has been suggested from the evidence of an eclipse.

Bibliography. Jesus of Nazareth, C. Gore, 1929; Life of Jesus, C. Noel, 1937; The Christ of the Gospels, P. Gardner-Smith, 1938; The Jesus of History, T. R. Glover, 24th ed., 1939; The Historic Mission of Jesus, C. J. Cadoux, 1941; Life and Times, A. Ederheim, 23rd impr. 1945; The Original Jesus, O. Borchert, 4th ed. 1946; Life, C. J. Cadoux, 1948.

Jesus College. A college of Cambridge university. It was founded in 1496 by John Alcock,

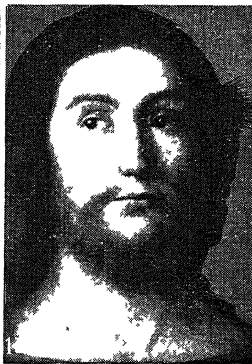
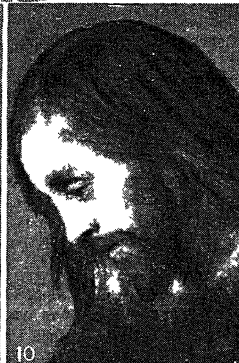
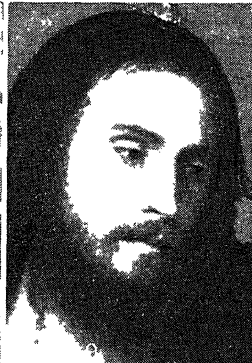
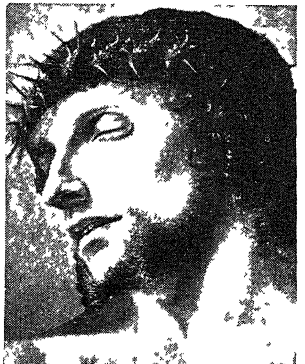
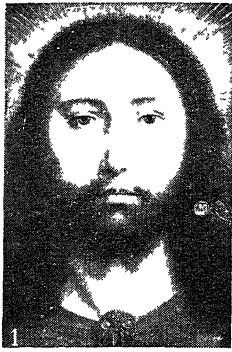


Jesus College, Cambridge, arms

bishop of Ely, whose badge (a cock standing on a ball) can be seen represented in brick, stone, metal, wood, glass, and paint all over the buildings. Its full title is "The College of the Blessed Virgin Mary, S. John the Evangelist, and the Glorious Virgin S. Radegund, commonly called Jesus College." Alcock gave it the buildings of the Benedictine nunnery of SS. Mary and Radegund which he had just suppressed. The college consequently differs from all others in plan; and all additions made have been in harmony with the older buildings. It stands somewhat away from the other colleges. Members have included Cranmer, Fulke Greville, Sterne, Coleridge,



Jesus College, Cambridge. Entrance gateway



1. Quinten Massys, c. 1460-1530 Antwerp 2. Cima, c. 1460-c. 1517, Nat. Gal., London. 3. Jan van Eyck, c. 1385-1440, Berlin 4. Matteo di Giovanni, c. 1430-95, Nat. Gal. 5. Guido Reni, 1575-1642, Bologna. 6. Leonardo da Vinci, 1452-1519, Brera Gal., Milan 7. Bellini, c. 1430-1516, Brera, Milan 8. Michelangelo,

1475-1564, Nat. Gal. 9. Titian, c. 1477-1576, Dresden 10. Rembrandt, c. 1606-69, Nat. Gal. 11. Raphael, 1483-1520, Vatican, Rome. 12. Angelo di Taddeo Gaddi, c. 1333-96, Nat. Gal. 13. Bellini, Academy of Fine Arts, Madrid 14. Correggio, c. 1494-1534, Nat. Gal. 15. Fra Angelico, 1387-1455, S. Mark's Gal., Florence

JESUS · THE SAVIOUR'S FACE AS PORTRAYED BY FAMOUS PAINTERS

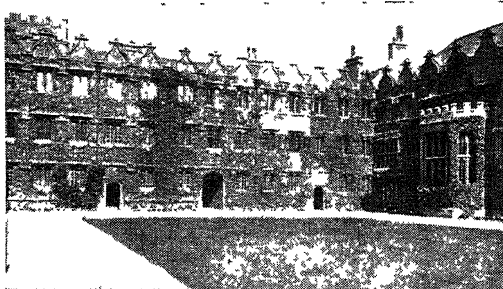
Davy, Malthus, and Sir Harold Spencer Jones. Sir Arthur Quiller-Couch was a fellow 1912-44.

Jesus College. Institution in the university of Oxford, founded by Queen Elizabeth in 1571 on the petition of Hugh Price. Its hereditary visitor is the earl of Pembroke. Many of its endowments came from Wales and gave it a strong link with the principality,



Jesus College, Oxford, arms

although it has never been exclusively Welsh. Its benefactors include Charles I (who founded an award for men from the Channel Islands), Charles II, Sir Leoline Jenkins, and Edmund Meyricke. Of its buildings, the hall, the chapel, and the principal's lodgings were put up between 1620 and 1640. The library, finished in 1679, contains earlier carved fittings, and its books include a large bequest from Lord Herbert of Chisbury. A new block, including a chemistry laboratory, was added in 1907. Distinguished among recent generations of Jesus men are J. R. Green, the historian, T. E. Lawrence of Arabia, and Viscount Sankey, lord chancellor.



Jesus College, Oxford. The inner quadrangle

Jet (Gr.-Lat. *gagâlēs*). A black, hard, and resinous variety of lignite. It is easily cut and carved, takes a high polish, and so is used for beads, and other ornaments. It is found in many parts of Europe, notably Bavaria, Germany; Asturias, Spain; and in France. Jet from Whitby, Yorks, was famous when Queen Victoria's widowhood made black ornaments popular wear. Vulcanite, celluloid, and black wax are often used as substitutes. The mineral is probably named from Gagas, a town in Asia Minor, where it was once largely mined. Powdered in wine, it was considered by the Greeks to be a cure for toothache.

Jethou. One of the Channel Islands. It is 4 m. E. of St. Peter Port, Guernsey, and is separated by a narrow strait from Herm. About a mile in circumference, it is composed of granite and is unfertile. It is crown property administered from Guernsey. See Channel Islands.

JET PROPULSION OF AIRCRAFT

G. Geoffrey Smith, Author, *Gas Turbines and Jet Propulsion*

An explanation of the principles of jet propulsion, its application to flight, and its advantages and disadvantages compared with the piston engine. See also Gas Turbine; Rocket Propulsion

Although boats have been driven by jets of water, the term jet propulsion is applied generally to the method of propelling aircraft by the reaction of a rearwardly directed jet of air and combustion gases. Whether using an airscrew or a jet, the aircraft gains its forward motion by the acceleration of a mass of air to the rear (Fig. 1). All aircraft are propelled according to the same basic principle—the third law of motion propounded by Sir Isaac Newton. This, the so-called law of action and reaction, states that every force has an equal but oppositely directed force. As force is proportional to the product of mass and acceleration (or the rate of change of velocity), it follows that

a specific thrust forward is produced by any combination of the variables, mass and acceleration, giving the same product and directed to the rear. An airscrew accelerates a large air mass to a relatively low speed, but in the jet system a relatively smaller air mass is ejected at high velocity. It follows that the propulsive reaction is produced internally and the jet does not push against the air. Actually, any matter impeding the jet

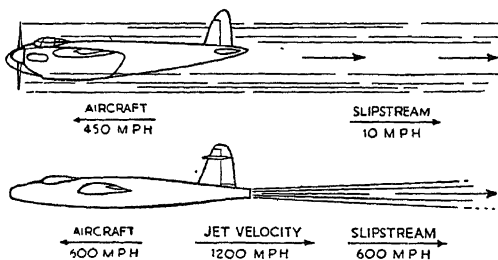
will result in a reduction of the forward thrust and the highest propulsive efficiency would be obtained if the jet was directed into a vacuum.

Jet reaction propulsion units are conveniently classed in four groups:

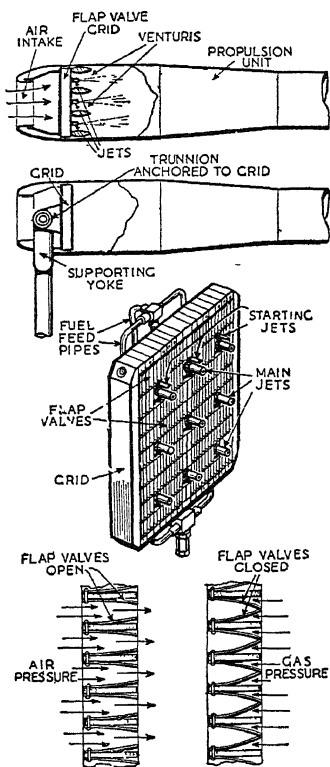
1. Rocket motors.
2. Continuous thermal duct engines.
3. Intermittent impulse duct engines.
4. Turbine-jet engines.

A rocket (*q.v.*) is a completely self-contained power plant carrying both fuel and oxygen for it to burn. It is thus the only known propulsion unit offering the possibility of interplanetary or space travel. All other types are earth-bound as they draw oxygen from the atmosphere for the combustion of fuel.

The conception of the continuous thermal duct is credited to Lorin in France in 1913, but its potentialities have not been realized in practice despite considerable investigation and experiment in several countries, including Germany, the U.S.A., and Great Britain. It is variously known as a "Lorin-Rohr," "ramjet," or "athodyd"; the last being an abbreviated version of aero-thermo-dynamic-duct. There are no moving parts in a ramjet, which has the shape of an elongated barrel. Internally the duct has a wide entry and narrow exit, with a ring of fuel burners fitted round the widest interior space. In flight, air is rammed into the widening intake at a velocity corresponding to the air speed of the aircraft. Following Bernoulli's theorem, the velocity of the air is lowered and the specific pressure increased. This compressed air is then heated by the combustion of fuel and expanded during its passage through the small-diam. exit nozzle, lowering the specific pressure but increasing the velocity, to issue as a high velocity propulsive jet.



Jet Propulsion. Fig. 1. Both conventional and jet aircraft are propelled by the reaction of an air mass projected rearwards



Jet Propulsion. Fig. 2. Diagram of the pulse-jet engine of the V1 flying bomb, and detail of automatic valve arrangement

At 1,200–1,250 m.p.h. at sea level the dynamic air pressure, resulting from the ramming effect in the widening duct, will be about 60 lb. per sq. in. or equal to the pressure raised by the mechanical compressor of the turbine-jet unit. Thrust varies approx. as the square of the speed but falls as the density of the atmosphere is reduced. The ram-jet, therefore, would appear to find its most likely application in high speed craft operating at low or medium altitudes. It suffers a severe handicap as it has no thrust at zero air speed. Some auxiliary power, probably a rocket motor, is required to launch and accelerate the aircraft to an air speed of 350–400 m.p.h., when the ramjet can be put into operation. Furthermore, the specific rate of fuel consumption is about three times that of the turbine-jet.

The intermittent impulse duct or pulse jet is best known as the power unit of the German flying bomb (*q.v.*), but it was also used to power piloted aircraft of the

interceptor type. Like the ramjet it consists of a tube or duct with a wide entry and narrow exit, operates with ram pressure, and requires to be launched. Immediately forward of the fuel jets is a grid furnished with a series of automatic non-return valves (Fig. 2), each comprising a pair of thin pen-nib steel rectangular leaves with contacting lips. In operation, air rammed in the widening intake passes through the valves and mixes with the petrol sprayed from the burners; the combustible mixture is ignited by a sparking plug. Ignition causes a rapid rise of pressure which closes the valves, and the mass of burning gases exhausts down the narrow propulsion nozzle. As the mass travels to the exit a depression is created behind the grid and the valves open under ram air pressure and a new charge of air is admitted. The pressure wave down the tube is followed immediately by a return wave in the opposite direction which tends to compress the new charge and to close the valves before ignition occurs. Rate of operation will be determined by the frequency with which the tube returns the pressure wave. The flying bomb unit functioned at about 45 cycles per sec. or 2,700 per min. Fuel consumption is inordinately high, being approximately four times that of the turbine unit.

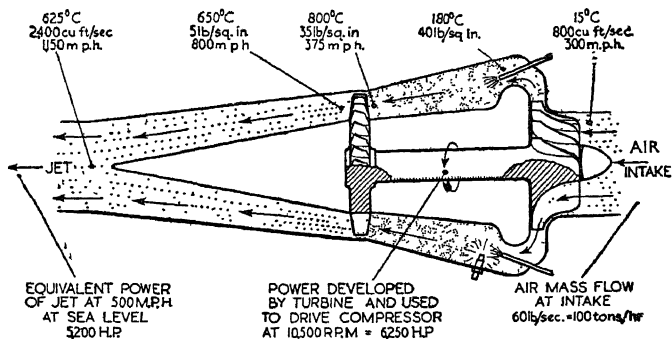
The gas turbine (*q.v.*) is the logical development of the internal combustion heat engine from intermittent operation, fluctuating pressures, and reciprocating motion to continuous operation, constant pressure, and rotary motion. Allied with the system of jet propulsion, it forms a power plant which, proportionately to the conventional piston engine and airscrew combination, is of reduced weight, bulk, and frontal area. It can be built in sizes

to produce a much higher power output than the piston engine, and thus meets the demand, as old as the art of mechanical flight, for more power in less weight and bulk. At the end of the Second Great War piston engines of 2,000–3,000 h.p. were constructed having a specific weight of approximately 1 lb. per h.p. and a fuel consumption of 0.5 lb. per h.p. per hr. Cylinder dimensions had reached optimum figures which could not be increased without impairing specific weight, and consequently high power outputs were obtained by using 24 or 28 cylinders. This multiplication of cylinders together with the necessary auxiliary equipment for supercharging, mixture control, ignition, and cooling rendered them complicated to design, construct, instal, service, and control.

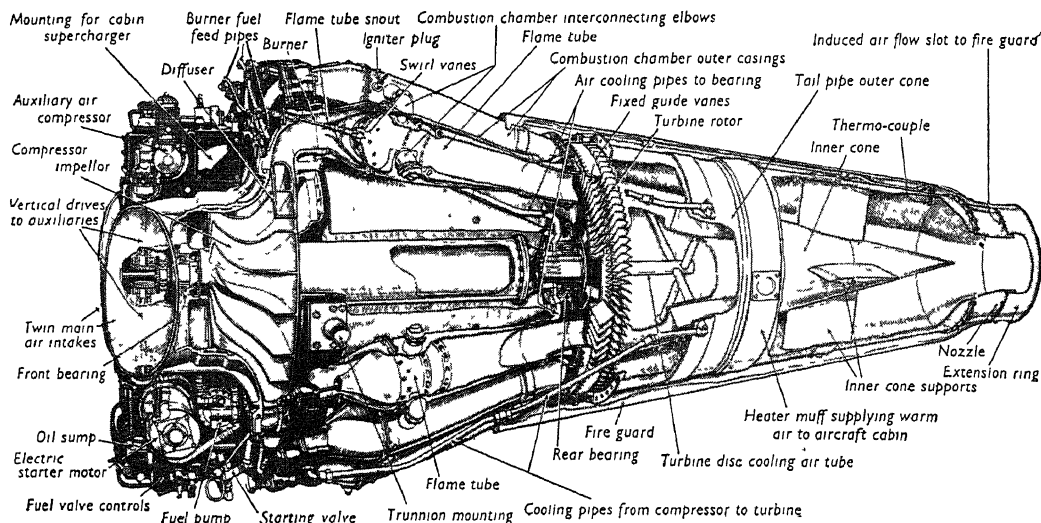
Whittle's Experiments

Forward thinking engineers had long before given attention to the potentialities of the gas turbine, but experimental stationary units had suffered from low component efficiencies, lack of suitable metals to withstand continuous high temperatures, and insufficient knowledge of gas flow and combustion. Only low thermal efficiencies had been achieved.

In Great Britain Air Comm. Frank Whittle, then a young flying officer in the R.A.F., foresaw in 1929, that owing to lowered temperature at high alts. compressor and turbine efficiencies would be improved beyond those obtainable on the ground, and that at high speeds air could be rammed into a tube with a wide entry and narrow exit, and some part of the work of compression achieved in that manner. The gas turbine is thus essentially a power unit for high speeds at high alts. Under these conditions, however, the



Jet Propulsion. Fig. 3. Variation of temperature, pressure, and velocity of the gas flow through a De Havilland Goblin turbine-jet unit
All illus. in this article by courtesy of "Flight"



Jet Propulsion. Fig. 4. De Havilland Goblin jet unit, sectioned to show internal components

efficiency of the airscrew is reduced, and consequently the alternative method of propulsion by jet was developed. Whittle took out his first patent applying the gas turbine to a jet propulsion unit in 1930, and started practical development work in 1933. Four years later a unit was run successfully on the test bed, and in May, 1941, the first flight was made in an experimental Gloster aircraft.

Up to that time, the U.S.A. had displayed little or no interest in the subject, but under wartime technical liaison a full disclosure was made, and in July, 1941, two complete Whittle units were sent to the U.S.A. and experienced personnel were lent. A U.S.-built aircraft powered by two Whittle-type units was first flown in Oct., 1942. Not until Jan., 1944, was the news released that both Great Britain and the U.S.A. had jet-propelled fighters in production. In the summer of 1944 British Meteor jet fighters went into action against the flying bombs.

Both Italy and Germany were early in the field. One Italian aircraft, the Caproni-Campini, succeeded in making a flight of 10 mins. duration in Aug., 1940, and another version made a highly-publicised propaganda flight from Milan to Rome in Nov., 1941. The Germans were more reticent, and little was heard of their efforts until jet interceptors appeared in action in 1944, and the Messerschmitt Me 163B Komet early in 1945. Projects for later types appear in Fig. 5.

Only after the termination of hostilities was it learned that their first experimental flight was made on Sept. 1, 1939, the day their army invaded Poland. There was no German-Italian cooperation.

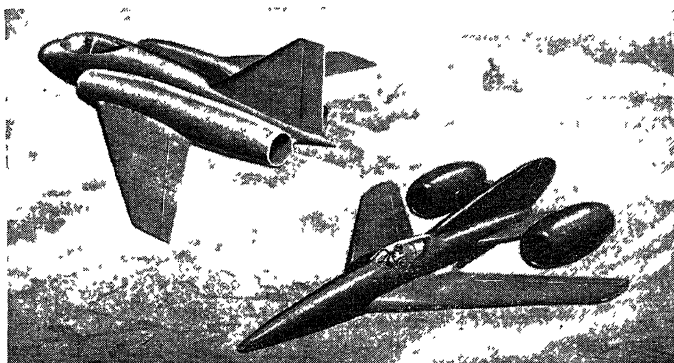
A Gloster Meteor fighter powered by two Rolls-Royce, Whittle-type, jet units was the first aircraft to exceed the speed of 600 m.p.h. when in 1945 it established a world record at 606 m.p.h. (Fig. 6). A year later the Meteor raised the record to 616 m.p.h., and in 1948 a standard U.S. fighter was timed at over 670 m.p.h.

To be a practical competitor of the well-established piston engine and airscrew combination, a jet propulsion unit could not depend entirely on ram compression or on the short-lived valves of the pulse-jet. Accordingly, resort was made to mechanical compression of the air in the duct by means of a rotary compressor. Power was required to drive the compressor

and for this a second rotary component, a turbine, was used.

In flight, air is rammed in the entry duct and forced by the compressor into the combustion chamber at a ratio of about 4:1. Into this compressed air kerosene is pumped at a pressure of 750 lb. per sq. in. through an atomiser and burnt continuously, after the manner of the plumber's blow lamp. The air/fuel ratio for combustion is approx. 14:1, but the overall ratio is about 60:1 and the excess serves as "dilution air" to lower the combustion temp. of 1,800°C. to about 800°C., the working temp. which turbine metals are able to withstand.

Some of the kinetic energy of the gases issuing from the combustion chamber is converted by the turbine into mechanical energy. In forcing an exit past the airfoil section blades, the turbine wheel is rotated at high speed—10,000 to 16,000 r.p.m.—to drive



Jet Propulsion. Fig. 5. German ramjet aircraft projects: left, the Heinkel; right, the Focke-Wulf

the compressor to feed in more air to maintain the continuity of the process. The gases are expanded through the turbine and the expansion continues in the tail pipe. They leave the propulsion nozzle at lowered temp. and pressure but at greatly increased velocity—1,000–1,200 m.p.h. For a rough approximation, it may be taken that for each 50 lb. propulsive thrust an air intake of 1 lb. of air per sec. is required, and for each lb. of air per sec. 100 h.p. is needed to drive the compressor. In other words, a unit developing 2,000 lb. thrust requires a turbine of 4,000 h.p. to drive its compressor.

The output of a jet unit is measured by the thrust exerted

creases with forward speed and the curve begins to rise after a speed of about 200 m.p.h. is attained, regains the equivalent of the static thrust at about 600 m.p.h., and thereafter continues to rise.

Thrust horsepower is expressed as:

$$\text{t.h.p.} = \frac{\text{Thrust} \times \text{Aircraft Speed}}{375}$$

If it were calculated from the theoretical thrust curve, t.h.p. would rise from zero when stationary to a max. when the aircraft speed was half the jet velocity and fall again to zero when the plane speed rose to the jet velocity. This would be unrealistic, and actually, owing to the influence of ram compression, t.h.p. rises continuously from zero when stationary.

Propulsive efficiency depends upon the ratio of the jet velocity to the aircraft speed. It is zero when stationary and 100 p.c. when plane speed equals jet velocity. Given the ratio R ,

propulsive efficiency η is determined by:

$$\eta = \frac{2}{R + 1}$$

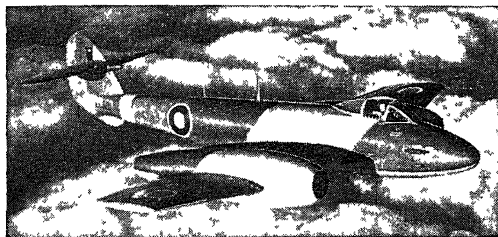
and will be 50 p.c. at a ratio of 3 : 1, 66.6 p.c. at 2 : 1, and 80 p.c. at 1.5 : 1. This contrasts remarkably with the characteristic curve of airscrew efficiency which, very approximately, may be regarded as falling from 80 p.c. at 400 m.p.h. to 60 p.c. at 600 m.p.h. and emphasises the desirability of jet propulsion for high speed aircraft operating at any speed in excess of, say, 500 m.p.h.

The gas turbine can be used to drive an airscrew and offers specific advantages for aircraft operating at medium speeds and heights. As compared with a jet unit, such a combination gives reduced fuel consumption and better take-off. Engines of this type are likely to be installed in commercial aircraft earlier than the pure jet unit. For high alt., high speed, and high performance, however, they cannot rival the jet engine. The standard Gloster Meteor, for example, will exceed 600 m.p.h. in level flight and climb to 30,000 ft., that is to say, higher than Mt. Everest, in less than three mins.

In addition to reduced weight, bulk, and installation drag, the turbine-jet unit has a number of other advantages over the piston engine, some being of particular importance for military applications:

1. Compressor impeller and turbine wheel are mounted on a common shaft running on ball or roller bearings, and there are no metal-to-metal sliding surfaces (like pistons in cylinders). Consequently, lubrication is simpler and oil consumption greatly reduced.
2. As power is produced continuously and motion is purely rotary, there are virtually no out-of-balance forces, and vibration is eliminated.
3. It is self-cooled by the internal air flow, and there is no need for a complicated and vulnerable cooling system.
4. No valves, ignition system, or timed injection of fuel is required.
5. It functions better at high alt. than at sea level, and therefore needs no elaborate supercharging arrangements.
6. It does not require an extensive "warming-up" period. Starting up from cold, it is ready for operation at full power in about three mins.
7. It is less critical regarding fuel. High specific calorific value is the prime characteristic, not anti-knock rating. Kerosene is commonly used, but petrol or diesel oil may be.
8. It is simpler to design, as fewer parts are required and each component performs one function continuously instead of several different functions intermittently.
9. Because of (8), less compromise is necessary in design, and a proved unit can be readily scaled up or down to produce units of higher or lower output.
10. Production is less complicated and fewer man-hrs. are required.
11. Installation in and removal from the aircraft are simplified (in some instances a complete unit can be removed in half an hr.), and maintenance is facilitated.
12. Fewer instruments and controls are needed, thereby reducing the duties of the pilot.

The most important aspect in which the turbine-jet compares unfavourably with the piston engine is its higher specific rate of fuel consumption at med. speed and alt. This tends to offset the weight advantage, reduce the duration of flight, and limit range. Although a cheaper fuel is used, operating cost is higher; a comparison on the basis of m. per gall. rather than galls. per hr. would be more rational. But at high speeds and alts., this disadvantage disappears.



Jet Propulsion. Fig. 6. Gloster Meteor 600 m.p.h. high altitude fighter, powered by two Rolls-Royce Derwent jet units

against the outer air by the mass of compressed air issuing from the nozzle end and is expressed in lbs. Before thrust can be converted to h.p. for the purpose of comparison with piston engines, it is necessary to know the forward speed of the aircraft. Thrust times aircraft speed gives mile-lbs. per hr., which convert to ft.-lbs. per min. and thence into h.p. At 375 m.p.h. 1 lb. thrust is equal to one thrust horsepower (t.h.p.). A qualification is necessary as the piston engine produces power at the shaft and an airscrew is needed to propel the aircraft. Shaft horsepower (s.h.p.) of the piston engine and airscrew combination must be converted to t.h.p. by including a factor for airscrew efficiency under the operating conditions. The efficiency of this component falls from its max. as either alt. or speed is increased.

Thrust is estimated by the standard equation defining a force:

$$F = \text{Mass} \times \text{Acceleration.}$$

This can be rewritten as:

$$T = \frac{\text{Mass} \times \text{Increase of Velocity}}{g}$$

Thus thrust is at a max. when the aircraft is stationary and should fall to zero when the aircraft speed equals the jet velocity. Ram compression, however, in-

Turbines have a shorter working life and the period between overhauls is shorter. Special metals and alloys are required for such items as combustion chambers and turbine blades exposed to continuous high temperatures.

Most of these relative handicaps will be progressively reduced as production and operating experience is accumulated. The turbine-jet engine is essentially a unit of high power output for high performance aircraft. It has achieved a concentration of power at low weight which has enabled aircraft performance to be stepped up beyond that possible of attainment by piston engines and airscrews. The Gloster Meteor, for example, is fitted with two Derwent jet units each developing 3,600 lb. thrust. At 600 m.p.h. this implies a propelling force of 11,500 t.h.p. If an airscrew efficiency of 70 p.c., a high figure for a speed of 600 m.p.h., is assumed, piston engines developing 16,400 s.h.p. would be required to equal the performance. Their total weight would be not less than 16,000 lb. against a weight of 3,000 lb. for the two jet units, and their bulk so large that they could not be accommodated in the aircraft.

Gas turbines and jet propulsion have exercised a profound influence on aircraft design and made possible revolutionary advances in aircraft performance.

Jetsam, JETISON, or JETSON. Term of English law. It means property thrown overboard from a ship in distress. It belongs to the crown as one of the Admiralty droits. See Flotsam and Jetsam.

Jettison (old Fr. *gettaison*; Lat. *jactatio*, throwing). Act of throwing over the cargo or tackle of a ship when she is in danger of sinking, in order to lighten her. Loss of this kind is treated on the general average principle, being divided between those who are interested in the ship and its cargo. See Average.

Jetty (old Fr. *jettée*). Structure projecting into the sea or other body of water. The terms pier, mole, jetty, and breakwater are often incorrectly used indiscriminately. A jetty may serve the purpose of a pier on a small scale by facilitating the landing of passengers from small boats, or their embarkation, but its principal purpose is to guide or concentrate the current of a river where it enters the sea, or to maintain the entrance to an estuary harbour, when it may serve as a breakwater as well. Jetties may consist of rubble

mounds, fascine work, earthwork contained by sheet piling, cribs, or piled stagings filled in with stone, or of masonry, or may be of open construction, with pile supports. See Breakwater; Mole; Pier.

Jeunesse Dorée, LA. French phrase meaning gilded youth. It was first used in 1794 for a set of French aristocrats who, after the death of Robespierre, tried to undo the work of the Revolution. Since then it has been frequently used to describe young men of wealth and position who devote their lives to pleasure and levity.

Jevons, WILLIAM STANLEY (1835-82). British economist and logician. Born at Liverpool, Sept. 1, 1835, he was the son of a merchant who wrote on economics. His education was completed at University College, London. During 1854-59 he was employed in the mint at Sydney. Again in England in 1866, he became professor of logic and political economy at Owen's College, Manchester, and in 1876 removed to London as professor of political economy. He retired in 1880, and was drowned whilst bathing near Hastings, Aug. 13, 1882.

Jevons published *Pure Logic* in 1864, and in 1874 *The Principles of Science*, while in 1870 had appeared his little book, *Elementary Lessons in Logic*. In 1880 appeared his *Studies in Deductive Logic*. He made a logical machine, by which he claimed that, the



W. S. Jevons,
British economist

premises being stated, conclusions could be secured mechanically, something like those produced on an adding machine. In 1871 appeared his *Theory of Political Economy*, and in 1875 his *Money and the Mechanism of Exchange*. More popular was his *Primer on Political Economy*, 1878, while his book on *The Coal Question*, 1865, aroused interest. He wrote on the fall in the value of gold and the state in relation to labour. As an economist he stressed the close connexion between political economy and mathematics, especially as regards the theory of utility.

Jewel, JOHN (1522-71). English scholar and prelate. A Devon man, he was born May 24, 1522, and educated at Merton College, Oxford. He remained at the uni-



John Jewel,
English prelate

versity as a tutor, and became its public orator. He was ordained and received a living, but his reforming tendencies led him to leave the country in 1555, and he passed some time in Germany and Italy. In 1558 he returned to England, and was at once a leading person in ecclesiastical affairs. In 1559 he was chosen bishop of Salisbury, and there he remained until his death, Sept. 23, 1571. Jewel wrote much in defence of the Church of England as settled under Elizabeth, and his teaching had influence on Hooker. His main work was his *Apology for the English Church*, which was published in 1562.

JEWELRY: HISTORY AND VARIETY

R. H. Granville Clark, Author of *The Complete History of Jewels*

The history of jewelry is here traced, together with indications of the many forms it has taken. See also articles on Brooch; Earring; Necklace; Ring, etc.; on Diamond; Opal; Precious Stones; Sapphire, etc.; and on Gold; Goldsmith; Platinum; Silver, etc.

Personal adornments have been used by mankind from prehistoric times. Primitive nations of modern times that dispense with clothing wear without exception some personal ornament. The cave dwellings of ancient man have revealed bone articles scratched with designs similar in character to the mural paintings in the caves themselves, and obviously used for personal decoration. It is difficult to date these objects, but some archaeologists give them an age as great as 30,000 years.

Jewels originated as articles of utility or as prophylactic and magi-

cal amulets. From the 2nd cent. B.C. the Chinese prized jade. The bracelet of many coils was a protection for the sword-arm. Brooches by their nature explain their origin. Many early necklaces, and some still in use in the Orient, have small hooks that hold the garments in graceful folds. The diadem or bandeau encircled the hair and kept it in place. The ring, from the earliest times was the insignia of authority. Amulets were almost always worn suspended on the breast, and from the original cords that held them have developed the magnificent

diamond necklaces worn by the opulent today.

The ductility of gold, its attractive colour and resistance to corrosion have, from the earliest times, been most highly favoured by jewel makers. The use of silver has been almost as popular; eastwards from Vienna to the China Seas, at least 90 p.c. of the peasant jewelry is mounted in silver, sometimes gilded with fine gold. Platinum has of recent years been largely used in diamond jewelry; the hardness of this metal, coupled with its whiteness that enhances the colourless quality of the diamond, helped to establish its use in the workshops of W. Europe and the U.S.A. Just before the Second Great War French houses inaugurated a fashion for yellow and red-gold jewels, but even in these the diamonds still have the collets and settings of platinum.

Emeralds are always set in gold, for the exceptional brittleness of the stones needs the more resilient metal and the warm colour of gold graces the beautiful green of fine specimens. The opal, owing to its susceptibility to changes of temperature, is almost always mounted in gold. Electrum was used for jewels as well as coins by the Greeks and Carthaginians.

Base metals have been used in jewelry almost as long as gold and silver, bronze and brass being commonly used in classical times. In the 18th century the brothers Pinchbeck invented an alloy named after them. Pinchbeck contains 4 parts of zinc to 1 part of copper; it is curious that the pinchbeck made before the end of the 18th century retains its pristine condition while later productions look shoddy and worn. Amethyst and topaz were often set in pinchbeck.

Successful Use of Iron

Iron jewelry in beautiful, lace-like designs was much in vogue in Germany at the beginning of the 19th century, and although many of these jewels were made to replace the gold ones given up in 1813 to the Prussian govt. to help in the war against Napoleon, they were made in considerable quantities some years beforehand.

Stainless steel, gilded brass, and various plastics have been used in the 1930s and 1940s for what is called costume jewelry; but costume jewelry also includes articles in silver and even in gold set with a variety of semi-precious stones.

Since the third quarter of the 18th cent. the diamond has been the most popular by far of the

precious stones; next comes the sapphire; then the emerald and ruby. There is also a demand for the opal, pearls, the Brazilian topaz, the chrysoberyl cats-eye, and star ruby and star sapphire. Lesser known but equally attractive gem stones such as morganite, kunzite, hiddenite, and uvarovite are also frequently sold by knowledgeable and interested retail jewellers.

In addition to the precious and semi-precious stones, an almost infinite variety of materials has been used by the jeweller. Ivory, coral, fossils, teeth of animals, the skulls of small rodents, tortoiseshell, bog oak, jet, amber, the claws of the lion and the tiger, human hair, shells, the needles of the pine, fish bones, nuts, ceramics, the oak apple, the antler of the deer, the hair of the elephant, the horns of cattle, the wing of the butterfly, the feather of the kingfisher, lava from Vesuvius, the remains of saints, leather and prepared skins (one widowed lady wore a miniature of her deceased husband painted on a portion of his skin, presumably removed after his demise). After Louis XVI's execution, his coat was cut into small fragments and mounted into brooches and rings and worn by the royalists.

Gold Work of Ancient Greece

Although the jewels of the ancient Egyptians are so often, even from the earliest dynasties, polychromatic, the interest in colour does not seem to have permeated to the goldsmith in Greece, where, apart from the sigils, the vast majority of pre-Christian jewels discovered have been examples of superb craftsmanship in gold work, relying on design alone without the aid of stones. Though goldsmiths of succeeding ages have endeavoured to produce work of a similar quality, very rarely, if ever, have they equalled these ancient Greek jewels; but it is the intaglios of ancient Greece that fascinate and inspire the envy and admiration of the modern craftsman. Comparable only with the coinage of the same period, these gems are sculptures in miniature.

The Romans, robust copiers that they were, adopted Grecian crafts, and as late as the 3rd cent. A.D. gem-engravers and goldsmiths adopted Greek pseudonyms to influence appreciation of their work. Sumptuary laws allowed only certain persons to wear gold. Consequently very choice intaglios in bronze and silver

rings are found up to the end of the 2nd cent. A.D. The ring was the favourite adornment from the 1st cent. A.D. Often small rings of the Roman period are described in museum and sale catalogues as children's rings, but the majority of these were worn on the upper joints of the fingers of adults, their ovoid shape being indicative of this. The Etruscans were great producers of scarabei, mostly in cornelian and sard.

Medieval Jewelry

After the fall of the Roman empire jewelry declined until the end of the Middle Ages, except from 8th to the 10th cent., when the wonderful garnet inlaid jewels of the Anglo-Saxons were produced; also the fine Celtic jewels made in Ireland ornamented with designs based on the "entrails of Buddha," known in the W. as the endless knot.

Most jewels of the Middle Ages, apart from regal and episcopal objects, were of gold or silver without stones except perhaps for a piece of the "horn of a unicorn" or a piece of the "true cross." Flat ring brooches engraved with votive or amorous phrases, or small figures of the saints, were the customary jewels.

The 15th and 16th centuries, with the fruition of the new learning and influx of gold and jewels from the western hemisphere, saw the creation of magnificent jewels such as the enseigne in the hat, the enamelled ring, the reliquary worn on the bosom held by a necklet as finely wrought as woven cloth, and those cameos and intaglios that so slavishly copied the ancient gems excavated in digging the foundations of the new buildings.

At first England imported these jewels from the Continent, but gradually many fine craftsmen settled in that country and produced those treasures with delicate blossoms enamelled on a white background that have survived from Stuart times.

In the 16th cent. the timepiece was made both small and portable. Fantastic shapes of skulls (reminders that our hours are numbered), fruits, and crosses were used. With the beginning of the 17th cent. came the fashion of wearing a miniature portrait that lasted until the introduction of photography in the 19th cent.

The discovery of diamonds in Brazil in 1728 and their subsequent export in large quantities to Europe led to their being in great demand among the

wealthy. In the new age inaugurated by the French revolution ancient gems were mounted in designs thought to be suitable: Napoleon brought fine ancient gems from Rome which were set and made into a parure for the Empress Josephine.

Boucheron and other French houses in the 1850s and 1860s produced the over-elaborate, over-decorated, immensely heavy gold jewels that are labelled Victorian whatever the country of origin. The shell cameo was much worn; and, after the death of the prince consort, Whitby jet, which the Romans had mined and the Phoenicians sought, became popular. This was cut and polished at Whitby, and used for brooches and many other forms of personal adornment. But these went out of fashion when Queen Victoria died, and the industry languished. Since the discovery in 1867 of vast deposits of diamonds in South Africa, millions of carats of diamonds have flowed from the mines to adorn the women of the world, but their price rises ever higher.

Jewish Agency for Palestine.

Organization set up under the British mandate for Palestine, to advise and cooperate with the Palestine government in matters affecting the establishment of a Jewish national home and the interests of the Jewish population. Its constitution was laid down at a world conference of Jews at Zürich, Aug. 14, 1929. Seats on its council are allotted to nations in proportion to their Jewish population, so that the U.S.A. has much the strongest voice. The council operates through an administrative committee and a nominated executive, membership of these bodies being divided equally between Zionists and non-Zionists. The agency is financed by the Jewish national fund, which draws its income from the united Palestine appeal and the united Jewish appeal. Expenditure over the period 1939-46 was nearly £18,000,000, of which 27 p.c. was devoted to agricultural settlement, 23 p.c. to immigration and rescue work, and 18 p.c. to political and security activities. The Jewish agency has done much to promote Hebrew language and culture. During the Second Great War its work in recruiting was of great value.

The agency was suspected of condoning, if not of actively encouraging, the outbreaks of terrorism in Palestine from 1945; its Jerusalem offices were occupied

and searched and several members of the executive held under arrest for four months in 1946. It opposed the restrictions placed on immigration in 1939, its aim being the creation of a Jewish state in the whole of Palestine after a Jewish majority had been secured by immigration.

After the setting up of the state of Israel, 1948, the agency continued to assist Jews to enter Palestine, publishing figures showing that over 100,000 entered in 1948. The first assembly of the Jewish legislative body (Knesseth Israel) met in the agency building in Jerusalem, Feb. 14, 1949. See Palestine; Zionism.

Jewish Chronicle. THE. Oldest Jewish newspaper in the world. A weekly published in London, it was founded Nov. 12, 1841, by Isaac Vallentine, under the editorship of the Rev. David Meldola and Moses Angel. In 1842 it was incorporated in The Voice of Jacob, but restarted as a fortnightly in 1844. Acquired in 1854 by M. H. Bresslau, the editor, it owed much of its influence and its prosperity to Dr. A. Benisch, Michael Henry, Asher Myers, Israel Davis, and Leopold Greenberg, who was an early collaborator with Dr. Theodor Herzl, founder of the Zionist movement. The Jewish World (founded 1873, acquired 1913) was amalgamated with the Chronicle in 1934. Next year, on the suspension of the Archives Israélites of Paris, this became the oldest Jewish newspaper. Its

London premises were destroyed in an air raid of the Second Great War, but production of the paper went on at High Wycombe.

Jewish Lads' Brigade. British organization for boys of the Jewish faith, especially those in the E. of London. Founded in 1894 on lines similar to the Church Lads' Brigade (*q.v.*), it inculcates in its members "habits of orderliness, cleanliness, and honour," gives instruction in military subjects, arranges individual and team rifle competitions, and teaches drill, gymnastics, signalling, and first-aid. Camps and sports are arranged in the summer. Its headquarters are Camperdown House, Half Moon Passage, Aldgate.

Jewish Regiment. This unit of the First Great War became the Palestine Regiment (*q.v.*) of the Second Great War.

Jewry. Term applied in the Middle Ages to any part of a city chiefly inhabited by Jews. The London thoroughfare called Old Jewry, leading N. from Poultry to Gresham Street, is so named from its early Jewish residents. In the 13th century much of the property here was in their possession. Jews also settled in the vicinity of the existing Jewry Street, Aldgate, and within the liberties of the Tower and S. Katherine's. In several other English towns the name lingers, e.g. Jewry Street, Winchester. At Leicester part of the enclosing wall of the Jewry still stands. See Ghetto; also Jews.

JEWS: THEIR HISTORY AND DISPERSION

* Norman Bentwich, LL.D.

The history of the Jews from the earliest down to contemporary times, with some indications of the effects on one another of the Jewish people and those who have come in contact with them. See also articles on Hebrew Language, Literature, and Religion; on Israel (in N.V.); Palestine; Talmud; Zionism, etc.; biographies of notable Jews; and Old Testament

The English word Jew comes through the old French *giu*, from the Greek *Ioudaios*, which became in Latin *Judaeus*, corresponding to the Hebrew *Jehudi*. Literally meaning a man of Judah, or of Judea, in the Bible itself (Esther 2, v. 5) Jew signified an adherent of Judaism. These two connotations of Jew—the one racial, the other religious—have persisted into modern times. Hence no clear definition of "Jew" is possible. Many Jews still regard the term as primarily racial, many others consider it primarily religious. Against the latter view may be cited the fact that the majority of Jews belong to one race; against the former that many proselytes

of other races are admitted to the synagogue, and that whole communities of Jews—unquestionably the Beni Israel of Bombay—are not of Jewish race.

A growing, indeed a dominant, body of Jewish opinion, known in modern times as Zionist, has also given to the term Jew a national implication. The Jew through the ages felt himself to be a member of a nationality, bound together not only by religion but by history, common destiny, and common aspirations. Though for nearly two thousand years deprived of a state and a geographical home, he cherished the hope of return to the land of his ancestors, the land of Israel, and from the last decades of

the 19th century made a resolute effort to regain the national home. He preserved in dispersion attachment to a spiritual Palestine; his tradition and literature were a portable fatherland; and after 1920 he was bound by association with a living and creative centre in the holy land.

Against the Zionist view there was the conviction of those Jews who wished to identify themselves nationally with their gentile fellow-citizens, that the definition of Judaism should be purely religious. Nationality, they held, is a political relationship which should be restricted to citizenship of the state of which the individual Jew was a subject. The religious tradition of Judaism on the other hand, despite the varieties of Jewish thought, should be the bond uniting Jews of various races and nationalities into a religious denomination which represented at once a creed and a way of life. Many, however, of those who professed this view were not themselves observant of traditional Judaism, and the religious bond alone proved weak.

Earliest Migrations

The Jews have a continuous history of 4,000 years. The earliest dates are uncertain, but the migration of Israel's ancestors from Mesopotamia to Canaan must be placed not later than 2000 B.C. The exodus from Egypt would, on this view, occur at 1225 B.C., followed by Joshua's invasion of Palestine soon after. David reigned about 1000 B.C. The fall of Samaria (with the overthrow of the northern kingdom of Israel) occurred 721 B.C., the fall of Jerusalem (with the overthrow of the southern kingdom of Judah) 586 B.C., followed half a century later by the return from the Babylonian exile. The next principal stages of Jewish history were Alexander the Great's conquest of the Punic empire, the Seleucid empire in Syria and Palestine, the Maccabean Revolt, 165 B.C., the elevation of Simon to the principality, 142 B.C., the entry of the Romans under Pompey into Jerusalem, 63 B.C., the reign of Herod, 37-4 B.C., the destruction of the temple by Titus, A.D. 70, and the final suppression of the Jewish national life by Hadrian, A.D. 130.

This period of antiquity witnessed the development of Judaism: the first tribal beginnings, the Mosaic revelation, the prophetic movement of the 8th cent. B.C., which established the



Jews. Map showing the tribal territories of ancient Palestine. The Levitical cities and cities of refuge are explained in Numbers 35

ethical monotheism of Judaism for all time, the adoption of the law as the expression of communal life in the 5th cent., and the growth of the "wisdom" influence in the 4th cent. It included also the encroachment of Hellenism under Alexander the Great, with the subsequent evolution of a Hellenistic Judaism especially in Alexandria; the spread of Pharisaism in the 2nd cent. B.C.; the rise of Christianity; separation of religion and state under the enforced loss of political independence. In all these periods Judaism absorbed much from its environment.

The united state under David and Solomon, the divided kingdoms of Judah and Israel under their successors, were based on theocratic as well as on political foundations. The prophets Amos, Isaiah, Jeremiah, and the rest, were something besides religious teachers. They were also statesmen; their message on the political attitude towards, for

instance, Egypt or Assyria was a divine oracle and a spiritual issue. In so far as the kings were inclined to run counter to the higher demands of religion they found themselves faced by the prophetic criticism and opposition, and, in general, the theory was developed that the national fate was conditioned by the virtue or vice of the nation. Moral sin brought its material consequences; apostasy caused defeat. World history was presented by the Hebrew prophets as the moral judgement of God on mankind and the nations.

This conception became the distinguishing mark of the Jewish attitude to life. Righteousness exalteth a people, unrighteousness casts it down. Goodness is the road to God, and by the same road God sends happiness in exchange. Out of this developed the view that the exchange is not man's right but God's grace, that man's part in the relation is service. When the Jews were passing from state to com-

munity, at about 250 B.C., the rabbi, Antigonus of Soko, said. "Be not as slaves that minister to the Lord with a view to receive recompense, but be as servants that minister to the Lord without a view to recompense; and let the fear of Heaven be upon you." The communal life was affected by this principle. Life was duty, service; performance would lead to prosperity, but the duty must be done for its own sake. God, and God alone, is master. Hence there developed an intense devotion to the law. Each of the great national uprisings—the Maccabees against Antiochus IV, and the Zealots against the Caesars—was caused by attacks on the law and Judaism. Not political independence, but religious autonomy was sought in each case, and in each case it was won—in the earlier case with a recovery of political power, in the later with its loss as a concomitant.

JEWISH DISPERSION. To trace the *diaspora*, or dispersion, of Israel no earlier, it is certain that more than four centuries before the Christian era a fully organized community of Jews existed in Egypt. When Alexandria was founded in 332 B.C., Jews were included in the new settlement, just as they figured in the Hellenistic cities of Asia Minor. It is probable that the Jews became to all intents and purposes citizens of the state, with religious autonomy.

Influence of Greeks and Rome

In Palestine, under the Maccabees, there was a struggle against the supremacy of Greek culture; elsewhere there was on the one side a Jewish propaganda, and on the other an admission into Jewish life of many Hellenistic elements. Philo of Alexandria was the supreme example of the Hellenic Jew—he accepted, or rather adapted, Greek philosophy, but fully maintained his Judaic monotheism and culture. The same thing happened in Rome, where there was an established Jewish community before the middle of the first century B.C. Judaism became attractive to the aristocracy, though the Jews in both Rome and Alexandria were mainly artisans, or followers of occupations exercised by slaves or freedmen. Neither Greek nor Roman could understand the Jew's devotion to the law, or his observance of the sabbath, just as both at first failed to understand Christianity.

The real conflicts arose over religious, not political, differences. The setting up of images led to

the acutest struggles of the Jews. Refusal to deify the emperor was identified with sedition. If Parthia resisted Rome on the political side, Judea won its victory on the religious side. The great Maccabean triumph over the Hellenising Seleucids was matched by the successful resistance against the deified Caesars. The most significant fact about the *diaspora* was its prefiguration of the fortunes of the Jews throughout the coming centuries. The Jews were attracted to the remoter provs. in the ancient world by the concession of privileges, just as in the British colonies Jews enjoyed rights before they gained them in Great Britain itself.

In the Middle Ages Jews were forced to wander from land to land under edicts of expulsion. Their fecundity also caused them to seek new homes. All these conditions reproduced themselves in modern times. It is possible that before the destruction of the temple there were more Jews outside than inside Palestine; it is likely that despite the restoration of a "national home" in Palestine, a large majority of the Jews will continue to live outside it.

Codes of Law Compiled

Almost simultaneously with the fall of Jerusalem the centre of Jewish study was transferred to Yainah on the coast in the S. There, and later in other parts of Judea and Galilee, was developed during the apostolic age the rabbinic literature which resulted in the code known as the Mishnah (c. A.D. 200). This was followed by the Talmud, a fuller code, and the depository of Jewish jurisprudence, homily, and folklore, of which one version was compiled in Palestine, the other in Babylonia (c. A.D. 500). Jerusalem had been closed to the Jews by Hadrian, and though in various part of the holy land Jews maintained themselves under the guidance of the patriarchate, the next centuries saw the hegemony in Jewish life removed to Persia (the ancient Babylonia). Here the Jews enjoyed a certain independence with a secular (almost political) head in the prince of the captivity, who was a dignitary of the Persian empire. Some notable academics were founded, partly popular and partly for scholars, and great progress was made in the study of the law, side by side with the development of industrial and agricultural pursuits.

In the meantime Christianity triumphed over paganism. Constantine issued an edict of tolera-

tion to Jews and Christians; but when Christianity became the religion of the empire, the emperors soon modified this policy. At the council of Nicaea, 325, steps were taken to separate church more effectively from synagogue. Easter was fixed in such a way that it rarely coincided with the Jewish passover. The emperors adopted an anti-Jewish policy, and the community of Palestine was gradually torn up. The obstinate war between Persia and Rome led to Jewish massacres, as the scene of the fighting was set mainly in provs. inhabited by Jews.

Persecution and Repression

Attack and murder became henceforth for several centuries the fate of the Jews, which was worsened by the fall of Rome. The Palestinian patriarchate was abolished in 425, and in Persia the academies also suffered under Firaz (457-484). Nevertheless, the saving power of religion and of the system of conduct based on it was clearly seen. Against this bulwark the repressive policy of the empire towards the Jews, typified by the laws of Justinian (527-565), was ineffectual. Jewish life was so organized as to be independent of outward conditions, and the dark ages that followed were illuminated within the Jewish home by an inner light which no external clouds could obscure.

The dark ages, so far as they affected the Jews, may be said to extend from the completion of the Talmud to 1492, the date of the expulsion from Spain. The period covers the Gaonic regime and the golden age in the Iberian peninsula. The most influential external events were the rise of Islam, the crusades, the development of the feudal system, which had no place in it for Jews, the infliction of the Jewish badge by Innocent III, the Black Death with its consequent anti-Jewish riots, the growth of popular feeling against the Jews owing to their enforced occupation with finance, and a variety of papal restrictions which culminated in the Inquisition. The restrictive legislation of Justinian was imitated in the resolutions of successive church councils.

The Moorish conquest of Spain, on the other hand, synchronised with the outburst of a great Semitic cultural movement, in which the Jews shared for 500 years. Moses Maimonides (1135-1204) was the chief representative of the scholasticism of the synagogue.



1. Polish Jews, wearing the tallith (tasselled shawl), reciting prayers for the dead. 2. Jewish cobblers of Iraq. 3. Polish Jew. 4. Palestinian Jew. 5. Young orthodox Jew of Ruthenia. 6. Youth Aliyah graduate,

who has become a policeman, saying his prayers after a strenuous watch; note phylactery on forehead. 7. Girls from a new settlement in Palestine. 8. Jewish immigrants from Yemen arriving in the Holy Land

JEWS: REPRESENTATIVES OF A RACE DISPERSED THROUGHOUT THE WORLD

The Jews were the carriers of the wisdom of the East, which included a larger part of the Greek and Roman heritage, to the West. They were, too, the link between Islam and Christendom. Notable was the development of a Hebrew poetry by masters such as Ibn Gebirol and Jehuda Halevi, the rise of a Hebrew philology with David Kimchi as its final authority, and the devotion of many to scientific pursuits, medicine, metaphysics, and astronomy.

Royal Protection

Despite restrictions, many Jews were admitted to the service of the state in the highest positions, especially in Spain. But the respite elsewhere than in Spain was of short duration, and community after community in northern Europe was broken up. The members were oppressed or exiled, and had frequently to seek new homes. Almost everywhere the Jews lived on sufferance, often enjoying royal protection and patronage, but not the grant of equal rights. They showed a remarkable power of recuperation and of intellectual ardour. Spain was specially beloved by medieval Jewry. Their hopes were centred in it; and the expulsion in 1492 was the severest blow suffered by them after the destruction of the temple. The period that followed was in many aspects the most calamitous in their long story.

THE GHETTO. For the Jews, the Middle Ages began with the Reformation and ended with the French revolution. In that period they were most completely isolated from the general civil and cultural life. The first ghettos were erected in Venice in 1516. In Poland and Lithuania, to which Jewish communities were attracted in the 15th and 16th cents. because of persecution elsewhere, there were no ghettos, and the Jews enjoyed a large measure of self-government. The Russian pale of settlement was a 19th cent. restriction which followed the partition of Poland; but in many districts ghettos arose in the period named.

Jews voluntarily concentrate in particular parts of towns, and as a result the term ghetto is often applied to such Jewish occupied districts. But the ghetto system proper was an enforced residence within narrow confines, resulting in overcrowding, exclusion from intercourse with non-Jews, restriction to the smaller trades and industries, with, on the one hand, a consequent all-pervading poverty and extreme distress, and on the

other the acquisition of strange and separatist customs of life and speech. Frequently raiders invaded the ghettos and added massacre to misery. The ghettos of E. and S. Europe lasted into the 19th cent.

Despite the degradation it imposed, the ghetto was not without its compensations. In it domestic happiness triumphed over material want; morality was high, and the intellectual outlook far wider than might have been anticipated. This is shown not only by actual intellectual accomplishments during the ghetto age, but also by the fine characters and wide mental range of many who, born and bred in the ghetto, made their mark in the wider world the moment the ghetto walls were thrown down. Religion had an opportunity which it amply utilised to idealise within a life sordid enough when viewed from without. Students and critics of Jewish communities often forget that some of their less admired characteristics are neither ancient nor intrinsic, but were induced by the ghetto, itself but a short and recent episode in the long story of the Jews. Hence the rapidity and thoroughness with which what may be termed ghetto characteristics were and are thrown off, under freedom from ghetto conditions.

There is evidence that Jews in small numbers were settled in England at an early date under the Norman kings. They were the property and servants of the crown, being protected because, while the church prohibited loans on interest, medieval states could not exist without such loans, and Jews were permitted and encouraged to act as financial capitalists. Before the age of Titus, as Josephus informs us, the Jews were a non-commercial people. It was their divorce from agricultural life that forced them into trade.

Sufferings in Medieval England

In Norman and Plantagenet England they were treated with a certain rough justice, cruelly interrupted by "popular" riot and massacre, such as occurred at the coronation of Richard I. After that dire experience, English Jewry was reorganized, but the expulsion of the Jews followed in 1290 when the arrival of Lombard bankers rendered the Jews no longer financially necessary. For several centuries there are records of only a few individual Jewish residents in England. With the 17th cent. a great change occurred in the European outlook. It was the period of colonial expansion in

which England and Spain came into conflict. Jews, driven from Spain, found their way to what were afterwards British colonies, and thus participated, both on the American mainland and in the Indies, in the expansion of the British empire.

Cromwell re-admitted the Jews, not by a formal order but by tolerating their presence in London in the very year, 1655, which marked the first important settlement of Jews in New York, then called New Amsterdam. The great increase of the Jewish pop. in N. America occurred two hundred years later as a consequence of Russian persecution. In 1880, not more than 250,000 were living in the U.S.A.; in 1946 over five million were there. While the American states were still under the British flag, various privileges in advance of European concessions were granted to the Jews, and from the first American Jews took in the national life a part similar to that played by English Jews when they were given the opportunity. The successful outcome of the equality granted to Jews in America reacted on European conditions, and the conferment of civil and political rights was followed in European countries by a similar incorporation of the Jews in the national life.

Famous Dutch Jews

The movement which ultimately led to the return of the Jews to England originated in the Netherlands, when a learned mystic of Spanish origin, Manasseh ben Israel, crossed to interview Cromwell on behalf of his brethren in faith. The Netherlands in the 17th cent. stood at the height of its adventure in freedom, in commerce, and in culture. It is sufficient evidence of the Netherland civilization to name three Jews who have made their country for ever famous: Grotius, Rembrandt, and Spinoza. Little wonder is it that Amsterdam became in Jewish eyes a New Jerusalem.

Here the Maranos (the "accursed" of the Inquisition) were able to throw off the mask, and resume allegiance to Judaism. Into such a family was born Spinoza (1632-77), who, though excommunicated, reluctantly enough, for his heresies, owed as much to Jewish scholasticism as to the doctrines of Descartes. Spinoza's work marks the re-entry of the Jews into the broad stream of Western thought, a rebirth of the mingling of Hebraism and Hellenism which had distinguished

Philo in the ancient and Maimonides in the medieval world. On the other hand, while Spinoza led (especially in his criticism of the Bible) a certain revolt against the older allegiance, another influential figure rising in the Levant, Sabbethai Zebi (1626-76), revived the Messianic hopes of the Jews. This was not limited to Jews; in Puritan England similar things occurred, and English millenarianism infected the Jews also with mystical hopes for the year 1666.

Sabbethai in early manhood roused the wildest enthusiasm among oriental Jews. He was proclaimed Messiah, and myriads expected him to lead them back in triumph to Palestine. Disillusion followed on his failure to maintain his pretensions, which left behind a deep and baleful disintegration of Jewish communal life. The 17th cent. failed to fulfil its early promise of liberation; and the 18th cent., the age of reason, opened for Jews under distressing conditions. They were still living in a medieval obscurity when the leader of a new trend appeared in the person of Moses Mendelssohn (1729-1786), a self-taught Jewish philosopher in Germany, who sought to win for his people both civil freedom and intellectual communion with their neighbours. A friend of Lessing, who under his inspiration wrote a celebrated plea for tolerance, the drama *Nathan der Weise*, Mendelssohn translated the Hebrew Bible into modern German, printing it in Hebrew letters for his brethren, in order to bridge the gap between the Jewish and general culture. He also induced the Prussian minister, von Dohm, to write a treatise advocating the granting of Jewish civil rights.

Plea for Intellectual Integration

Mendelssohn set out his philosophy of the relation of the state to religion in a book *Jerusalem*, of which Kant wrote, "I consider your book the herald of a great reform which will affect not only your nation." His influence opened a new era for the Jewish communities of Germany and central Europe. The Jews stepped again into the arena of culture and science. It was the era of the so-called cultural "enlightenment," which aimed at integrating Jewish life with that of the peoples among whom the Jews lived.

From Mendelssohn's time, the Jews of Germany and of western Europe developed an enthusiasm for the study of the history and literature of Judaism. Scholars

elaborated a "Jewish science," designed to interpret the tradition in the light of modern knowledge so as to make it attractive to the emancipated as well as the orthodox Jew and also to the curious Gentile. Yet the main movement amongst the Jews assimilating the culture of their environment was "out of the ghetto into the human." But when, during the 19th cent., national feeling was revived in the peoples amongst whom they dwelt, and repression of their efforts to identify themselves completely with their environment was provoked by their economic and intellectual prominence, the Jews, particularly in eastern Europe, also revived their national faith. The new motive was: "out of the ghetto into the nation."

Political Equality in W. Europe

The French revolution initiated the movement for extending to the Jews as individuals civil and political equality with the other citizens of the country in which they dwelt. Beginning in N. America and in France, the Jews were accorded the rights of man; and emancipation was won in all the countries of western Europe. In eastern Europe, however, they were denied civil and political equality till the end of the First Great War. The majority of the Jews in the world till then were subjects of the tsarist empire, which denied them equality and compelled them to live in restricted areas. The treaties concluded in 1919 sought to assure them conditions of equality in Poland, Czecho-Slovakia, Rumania, and other states which were brought into being or enlarged. Not only did the treaties prescribe individual rights, but as a community Jews were to enjoy special minority rights for maintaining their distinctive culture. In Russia itself, through the Soviet revolution, all the discriminatory legislation against them was abolished, and the attempt to stir up prejudice and hatred was made a crime.

ANTI-SEMITISM. During the following 25 years, however, a terrifying revival of anti-Semitism in a most virulent form plunged the Jews in many countries into worse sufferings than those of the dark ages. Hatred of the Jews on racial grounds had been preached by reactionary parties in Germany, Austria, and even France, during the latter part of the 19th cent.; but the Nazi party in Germany made hatred of Jews the instrument of its

rise to power and of the rallying of the German people. The Jews were the chosen scapegoat of a nation suffering from a sense of frustration. When the party came to power in 1933, the machinery of the state was used to destroy them. They were the first victims of the crime which has been called genocide, that is, the murder of a people. The pseudo-scientific basis of the Nazi agitation was the inferiority of the Semitic race to the Aryan. The Jew, it was said, was the source and representative of what is low and degrading in modern civilization. Their anti-Semitic propaganda invented a Semitic conspiracy to destroy the Aryan race and Christian civilization. The charge was founded on a forged and frenzied book, *The Protocols of the Elders of Zion*.

The Nazis, seizing on popular prejudice, and systematically exciting the lowest passions, made anti-Jewish propaganda one of their principal weapons for dividing the nations against whose independence they conspired. In Germany itself they started by excluding all persons of Jewish race, so-called non-Aryans, from every form of public life. Then they excluded Jews from every form of economic activity. They segregated them in ghettos, and put their leaders in concentration camps. Finally, after the outbreak of the Second Great War they resolved on extermination of the Jews in all countries occupied by German forces. They practised mass-deportation of Jews, followed by mass-murder, and 5,721,600 perished in central and eastern Europe, including hundreds of thousands deported from the Netherlands and France.

Result of Nazi Oppression

The racial poison thus spread remained as an evil legacy in the countries which suffered from Nazi oppression. That, and Europe's associations of horror, left a great part of the one and a half million Jews who survived in the continent of Europe, outside the U.S.S.R., anxious to emigrate, even though the governments in the countries to which they belonged were no longer anti-Semitic.

This destruction of European Jewry shifted the geographic centre of the Jewish people from central and eastern Europe to the U.S.A., where the two million, or more, living in greater New York city constitutes by far the biggest aggregation of Jews ever formed. In Canada there are about 170,000, in S. America some half million

Jews. With the U.S.A.'s five million, these made up in 1946 half the Jewish pop. of the world. In the U.S.S.R., where Jews enjoy complete civil equality, and an area of 14,000 sq. m. was set aside in 1928 in the dist. of Birobidjan as the Jewish autonomous region of the Far East (pop., 1935, 60,000), some 2,600,000 remain. Of the Polish community, which before the Nazi occupation numbered 3,351,000, only 80,000 survived in Po'and; a few thousand more saved themselves by flight. Palestine, which at the end of the First Great War had a Jewish pop. of 50,000-60,000, had in 1946 ten times that number. In the British Commonwealth the Jewish pop. totals about three-quarters of a million of whom 385,000 are in the U.K. They include nearly one hundred thousand who found refuge from the Nazi persecutions.

THE JEWISH CONTRIBUTION. In the countries in which they have been accorded equal civic rights the Jews have taken their full part in every aspect of public life. During the First Great War, while military service was voluntary in the U.K., the British dominions, and the U.S.A., the Jews contributed more recruits proportionately than the rest of the pop. In the British empire, which then had a total of 400,000 Jews, 50,000 were in the forces. The Australian contingent had as its supreme commander a Jew, Sir John Monash. In the Second Great War over a million Jews were numbered in the armed forces of the Allies. They included an exceptionally high proportion of men decorated for gallant service, particularly in the armies of Soviet Russia. Some of the highest commanders of those forces were Jews, the best known being Chernyakhovsky (*q.v.*).

During the 19th and 20th cents., the Jews have produced an exceptional number of philosophers, scientists, economists, and artists, including Karl Marx, Einstein, and Ehrlich in Germany, Bergson in France, Freud in Austria. In England their most distinguished figure has been the statesman, Benjamin Disraeli (Lord Beaconsfield). Other notable British Jews include the first Lord Reading, Lord Samuel, and Edwin Montagu.

By the middle years of the 20th cent. it was not in the larger communities of the dispersion, but in the twentieth part of the Jewish people living in the national home

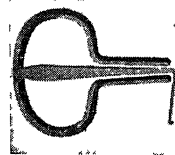
in Palestine, that Judaism flourished again as a civilization. The supreme value to the Jews of the national home was that it forged a fresh spiritual bond for sorely tried communities threatened with disintegration. Einstein pointed out that what united the Jewish people for centuries was their law of conduct embodied in their dearly-guarded tradition and the thought of the past. Common pride and interest in the productive and active life of the Jews in Palestine was a fresh force making for unity, and rekindling a faith in the creative power of Judaism in its social aspects.

Bibliography. The Jews of Today, A. Ruppin, 1913; The Jew and his Neighbour, J. Parkes, 1930; A History of the Jews, A. L. Sachar, 1930; Jewish Life in the Middle Ages, Israel Abrahams, new ed., ed. Cecil Roth, 1932; Short History of the Jewish People, C. Roth, 1937; A Book of Jewish Thoughts, J. H. Hertz, 1943.

Jew's-Ear (*Hirneola auriculjudae*). A fungus of the family Hymenomycetaceae. When the air is moist and the fungus is fully expanded, it is shaped like three-fourths of a saucer, with the inner surface thrown into folds and swollen veins. This surface is smooth and of a brownish flesh tint. The exterior is more olive, and covered with a delicate pile. It grows chiefly on dead elder trunks, and looks like a swarthy human ear nailed to the tree. When the air is dry it shrivels and becomes horny in texture; but expands again on the return of humidity. The microscopic spores are borne by the entire inner surface. In China its gelatinous character makes it an article of food. *See* Fungus.

Jew's Harp. Small musical instrument consisting of a metal frame holding a steel tongue set in vibration by strokes of the finger. The neck of the instrument is held between the teeth, varying breathing reinforces the tone, and tongue position regulates pitch. The origin of the name is uncertain but is supposed to be jaw's harp.

Jew's Harp. Small musical instrument



Jex-Blake, SOPHIA (1840-1912). Pioneer British woman doctor. Daughter of an ecclesiastical lawyer, T. Jex-Blake, she was mathematical tutor at Queen's College, London, 1858-61. Then in

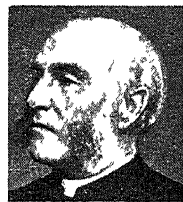
1866 she went to Boston, Mass., to study medicine. She matriculated in 1869 in the medical faculty of the university of Edinburgh. Not being allowed to take her degree, she initiated a successful action against the university which, however, was lost on appeal to the court of sessions, 1873.



Sophia Jex-Blake,
British doctor
Courtesy of
Macmillan & Co.

With Elizabeth Garrett Anderson, she founded the London school of medicine for women in 1874; in 1878 she started practice in Edinburgh; and there in 1886 founded a school of medicine for women eventually recognized by the university. She retired in 1899, and died Jan. 7, 1912. *See* Anderson, Elizabeth Garrett.

Jex-Blake, THOMAS WILLIAM (1832-1915). A British schoolmaster. Elder brother of Sophia Jex-Blake, he was educated at Rugby and Queen's College, Oxford. Having taken high classical honours, he became a master at Marlborough college, 1855. For ten years from 1858 he was an assistant master at Rugby, after which he was made principal of Cheltenham College. During 1874-87 he was headmaster of Rugby. Dean of Wells, 1891-1911, he died July 2, 1915. Of his daughters, Katharine (b. 1860) was mistress of Girtton, Cambridge, 1916-22, while Henrietta was principal of Lady Margaret Hall, Oxford, 1909-21.



T. W. Jex-Blake,
British schoolmaster

Jezebel. Daughter of Ethbaal, king of the Sidonians, and former priest of the Phoenician goddess Astartē. She married Ahab before his accession, and was the first Canaanitish woman to share the throne of Israel. In her hands Ahab was a puppet. She established Phoenician worship in the kingdom, had Naboth stoned, persecuted the prophets of Israel, and, surviving her husband, saw her daughter Athaliah married to Jehoram. Thrown from her window at the command of Jehu, she was trampled to death under the hoofs of his chariot horses. Her name has been ever since

a title of reproach as that of a woman unscrupulous, cunning, and abandoned. Her story is told in 1 Kings 18, 19, 21, and there are references to her elsewhere in the Bible. See Ahab.

Jezreel. A city of Canaan, Palestine, standing on a knoll about 11 m. S. of Nazareth. King Ahab had his capital there, and all the leading events of his reign took place in the neighbourhood (1 Kings 21).

Jezreelites. A religious sect founded in England in 1875 by a private soldier, James White (1840-1885), who adopted the names James Jershom Jezreel. He professed to have received a divine call that appointed him a messenger of God and granted him revelations. The headquarters of the sect were at Gillingham, Kent, where work began on the construction of a college and vast temple. The Jezreelite creed maintained that Christ, by His death, redeemed the souls only of those born since Moses. At the millennium Christ would be greeted by the 144,000 of Rev. 7, endowed with immortal bodies, to which select band belonged the Jezreelites. White died March 1, 1885, and on the death of his widow, Queen Esther, June 30, 1888, the sect became almost extinct. Early in the 20th century Michael Mells (d. 1921) of Detroit, claimed to have received the mantle of Jezreel and came to complete the temple at Gillingham. Adopting the title of Prince Michael, he was received by the Jezreelites as a teacher, but lack of funds prevented the fulfilling of his plans.

Jhalawar. A former state of Rajputana, India, now a part of Rajasthan. Millet, maize, and cotton are the chief crops. The exports include oilseeds; imports are piece goods. The ruler was entitled to a salute of 13 guns. The area of Jhalawar is 824 sq. m. and its pop. 122,299.

Jhang. Dist., subdivision, and town in Multan division, West Punjab, Pakistan. Its area is 3,363 sq. m. It is drained by the Chenab and Jhelum rivers, which unite S.W. of the town; the northern section is irrigated by the Lower Chenab canal, as the rainfall rarely exceeds 10 ins. annually. Of the total area about half is under cultivation, wheat being the chief crop. The industries include the manufacture of cotton goods. Wheat and oil seeds are among the exports, piece goods and iron the principal imports. Pop. about half a million.

Jhansi. Division, district, subdivision, and city in the Uttar union, India. Approximately one-third is under cultivation,

millet and wheat being the chief crops. The exports include oilseeds; sugar, salt, and oil are among the imports. Jhansi city is a rly. junction. Area of div., 10,553 sq. m.; dist., 3,606 sq. m. Pop. of div., 2,553,492; dist., 773,002; sub-div., 198,874; city, 89,000.

Jhelum. River of Kashmir and Pakistan. It rises in Kashmir and flows through the Punjab to join the Chenab. Its length is 450 miles. Navigable below Islamabad, it is of great importance for irrigation, its two canals supplying water to the doab between the Chenab and Jhelum. It is the ancient Hydaspes.

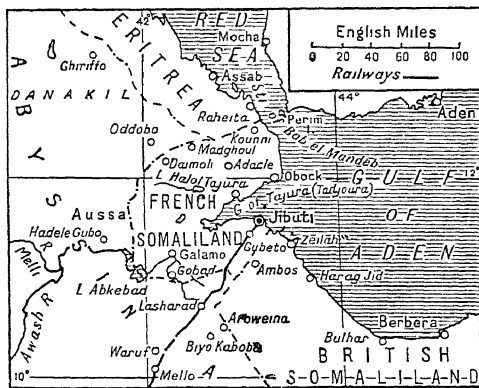
Jhelum. District of Pakistan, and town in Rawalpindi div. of West Punjab. Area of dist., 2,774 sq. m. About one-third is under cultivation, wheat and millet being among the crops. Fine horses and cattle are reared. Timber, stone, and grain are among the exports; imports include piece goods. Jhelum town, on the river of that name, is a centre of the timber trade. Pop. dist., 629,658; town, 33,191.

Jib (Dan. *gibbe*, Dutch *gippen*, to turn suddenly). Foremost sail in any sailing craft. Triangular in shape, it is set between the foremast head and the bowsprit. Jibs are of various kinds, e.g. the balloon jib used in racing yachts, the flying jib of schooners, and the small storm jib used in bad weather. There are also jib top sails. A jibboom is a continuation of the bowsprit used for setting the jib. See Sail.

Jibuti, JIBOUTI, OR DJIBOUTI. Seaport of French Somaliland, standing on the coast opposite Aden. Since 1892 it has been the administrative headquarters of the colony. Jibuti is connected by rly. with Addis Ababa, and is the chief

outlet for the trade of Abyssinia. Pop. 10,421.

In 1935 Italy was granted 20

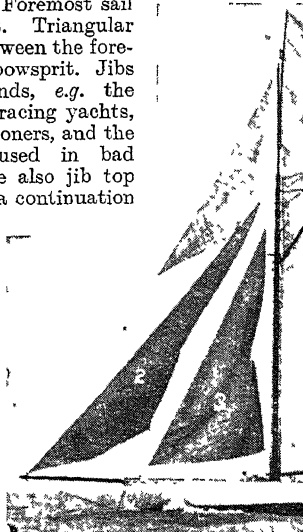


Jibuti, French Somaliland. Map showing its position in relation to neighbouring countries and to Aden

p.c. of the shares of the Jibuti-Addis Ababa rly., and in 1939 Mussolini demanded the cession of the port to Italy. French Somaliland adhered to the Vichy government in 1940, so that use of Jibuti was denied to Allied forces until on Dec. 28, 1942, the colony came over to the Fighting French. Two days later the 33 members of the Italian armistice commission at Jibuti were arrested and sent to a British internment camp. Under an agreement with Abyssinia signed Sept. 5, 1945, France recovered her rights over the rly. to Addis Ababa.

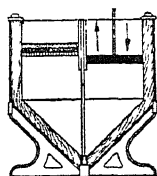
Jičín. Town and dist. in Bohemia, in the republic of Czechoslovakia. The town is 61 m. by rail N.E. of Prague, and is a junction on the main road from Prague to Breslau.

Jig. In metallurgy, the name of a simple machine for the preliminary dressing of ores, by which a certain portion of worthless earth or stone—gangue—is separated from the more valuable material. A common form consists of a vertical box with a tapering bottom, divided into two portions, in one of which a piston works up and down while the



Jib sails of a cutter. 1. Flying jib. 2. Jib. 3. Foresail

other is fitted with a horizontal screen on which the crude ore is placed, after having been broken rather fine. The box is filled with water, and as the piston operates the water is oscillated up and down through the screen, thus washing the lighter and worthless material



Jig used for dressing ores

away over the top of the box, while the more valuable portions gradually work down through the screen into the bottom of the jig, from which they are removed from time to time. In other jigs the screens themselves are worked up and down by suitable mechanical arrangements.

Jig. Device used in engineering shops for positioning and guiding the various tools used in drilling, reaming, and boring. It is needed particularly in the precision production of interchangeable parts to ensure exact duplication. For accurate positioning of drilled holes, a jig is provided with means for locating the article by certain surfaces and then clamping it with total absence of slip. A top or side plate, according to the surface to be drilled, is placed against the work, the plate having holes of suitable size to receive the drilling bits as they pass down to the work. The guide holes are lined with hardened steel bushes to prevent enlargement by friction.

A plate jig, the most simple, is used for flat objects which require drilling on a top face, and is set by alining ledges on the plate with the sides of the object being drilled. A box jig surrounds the object and, in conjunction with a multiple-spindle drilling machine, bores a number of holes simultaneously. Some types turn over on to various faces so as to drill holes from each side. Others, not concerned with

cutting or drilling, fix articles in position for soldering or brazing. Aircraft and motor vehicle factories use large jigs which cut out and drill assemblies in a single operation.

Jig (Fr. *gigue*, Ital. *giga*, Ger. *geige*, fiddle). A lively dance. The jig is the single national dance of Ireland, where it is made expressive of a wide range of emotion, and has been accompanied by a correspondingly characteristic music. Various rhythms have been used in the music of the jig, but some form of triple time, or duple time with triple subdivisions, is the most usual. Many sonatas, suites, and partitas of Corelli, Bach, Handel, and contemporaries contain jigs, or giges, as lively concluding movements.

Jigger. Apparatus serving the purpose of a small crane or winch for lifting light articles out of the holds of ships. The hoisting rope is passed over a pulley suspended from the rigging. Jiggers are portable and generally actuated by hy-

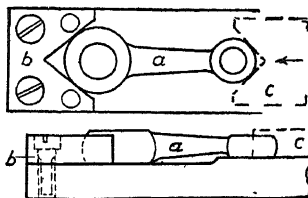


Fig. 2. V-block locating jig. The lever to be drilled, a, is located at one end of the stationary V-block, b, screwed and dowelled to the jig. The work is held in position at the other end by the sliding V-block, c.

draulic power. The word is also used for a man who cleans ores; a potter's wheel on which earthenware vessels are shaped; the rest for a cue at billiards; and a minute species of flea, found in S. America and the W. Indies, which burrows beneath the skin and produces irritating ulcers. See Chigoe.

Jig-Saw. A puzzle consisting of fitting together pieces of wood or card cut to various shapes, so as to form a picture. Usually the picture has been pasted on plywood, which is then cut into varying shapes with a fret-saw. The pieces are jumbled together and the solver has to arrange them correctly. Provided the puzzle is of normal rectangular shape, the

corners and straight edges should be selected first. Pieces of a similar colour may be worked on together, the blocks being later joined up. By looking at the back of the puzzle and observing the grain of the wood, it is possible to orientate any piece for one direction at least.

Jihlava. A town of Czechoslovakia. Formerly known as Iglau, it is situated on the Jihlava 50 m. W.N.W. of Brno, just within Moravia. An ancient town with many fine buildings, it was formerly noted for the silver mines in the vicinity, which are now exhausted. It is a centre of woollen manufacture and has pottery and glass works. Pop. 25,634.

Jijiga OR JIGJIGA. A town of Abyssinia, c. 50 m. E. of Harar. After the capture of Mogodishu from the Italians on Feb. 25, 1941, Gen. Cunningham's troops advanced N. towards Jijiga, occupied by South Africans on March 17.

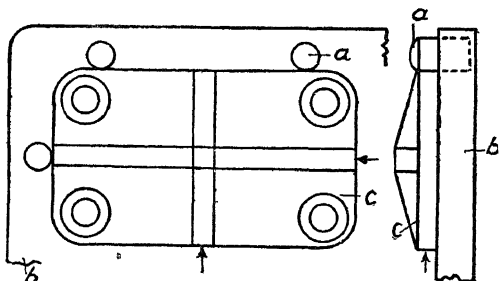
Jim Crow. A term sometimes applied to a negro in the U.S.A. It owes its origin to Thomas Rice (1808-60), a native of New York, who hit upon the idea of impersonating negro characters on the stage with the aid of burnt cork. He won his chief success in 1828 with a song and a dance whose refrain ended with the couplet—

Wheel about and turn about and
do jis so
And every time I wheel about I
jump Jim Crow.

The popularity of this song brought in a type of negro minstrelsy. Hence the Jim Crow car, a public vehicle in which coloured passengers are separated from white, and Jim Crow seats in theatres.

Jim the Penman. Nickname of James Townsend Saward, a notorious forger. A barrister, his extravagant tastes brought him to ruin, and he began forging cheques, bills of exchange, etc., which he obtained from a widely organized gang of criminals. Many of his forgeries were carried out on the Continent, and banks were victimised in France, Spain, Belgium, Russia, as well as England. Speaking French and German fluently, he evaded the authorities till 1857. During his career he collected over £100,000 and created a huge criminal organization. Sentenced to penal servitude for life, he died in prison. Jim the Penman, a drama by Sir Charles Young, was produced at the Haymarket, London, April 3, 1886, and performed 200 times.

Jind. Former Phulkian state of India, absorbed in 1948 in the Patiala and East Punjab union.



Jig : in engineering. Fig. 1. Jig with locating pins, a; these are driven into the body of the jig, b. The stay plate, c, is located from two sides by the pins, so positioning the holes through which the material is drilled

Jind comprises two detached areas of semi-desert country with a total area of 1,299 sq. m., and a population of 361,812, of whom more than three-quarters are Hindus and Jains. The country is irrigated by canals, and the chief crop consists of millet. Sangrur, the capital, is 75 m. N.W. of Delhi. The rulers were always loyal to the British authorities, to whom they rendered signal services both during the Mutiny and the second Afghan War. The maharaja is entitled to a salute of 13 guns.

Jingle, ALFRED. Character in Dickens's *Pickwick Papers*. A loquacious strolling player, of shabby appearance but engaging manners, who imposes upon the *Pickwickians* and their friends, he eventually lands in the Fleet prison, from which he is rescued by Mr. *Pickwick's* generosity. He is memorable for his peculiar staccato manner of speech, e.g. "English girls not so fine as Spanish—noble creatures—jet hair—black eyes—lovely forms—sweet creatures—beautiful."

Jingoism. Slang term applied to bellicose and provocative patriotism. It came into use in 1878, being derived from the words of a popular song of the music-hall singer, The Great Macdermott, in which occur the words, "We don't want to fight, but, by Jingo, if we do, we've got the ships, we've got the men, we've got the money too." This song was a reflection of popular mistrust of the Russian attitude to Turkey and the Balkans. The French equivalent is *chauvinism* (q.v.).

Jinja. Town of Uganda, in the Eastern prov. It is at the head of Napoleon Gulf, on Victoria Nyanza, above Ripon Falls, where the lake discharges into the Upper Nile. It is on the rly. from Namasagali to Kampala. Work on an irrigation dam and hydro-electric power scheme at Owen Falls near by was begun in 1949. See Ripon Falls.

Jinn or **DJINN**. In Mahomedan mythology, a race of spirits or beings dwelling in the lowest firmaments. According to the Koran there are good and bad jinn, all subject to death and capable of future salvation or damnation.

Jinnah, MOHAMMED ALI (1876-1948). Indian statesman, born Dec. 25, 1876. Educated at Karachi and in England, he became an advocate in 1906, and was a member of the imperial legislative council in 1910. From 1920 president of the Muslim League, he was the author of the Pakistan scheme for the partition of India. In 1940

he pledged the support of his followers for the British war effort without prejudice to political developments afterwards. He opposed the formation of an Indian national government on the ground that the numerical superiority of the Hindus in a united India would be such



Mohammed Ali Jinnah, Indian statesman

as to override the Muslims.

The breakdown of a conference called by Lord Wavell in 1945 was largely due to the intransigence of Jinnah, who refused to allow non-League Muslims on the executive council. He likewise opposed the British scheme for an interim government in 1946, and was responsible for the "direct action day" which led to an outbreak of mob violence in Calcutta. Adhering to his resolution not to take part in an all-India government so long as he was president of the Muslim League, he caused that body to boycott the constituent assembly. When in 1947 the dominion of Pakistan was created, Jinnah became its governor-general and was styled Quaidi Azam (great leader). He died at Karachi, Sept. 11, 1948. See India; Muslim League; Pakistan.

Jinricksha. A Japanese word meaning a small two-wheeled vehicle with a hood. It is pulled by one or more men and is fairly common in Japan and other parts of the East. See Japan; Rickshaw.

Jinsen. Port of S. Korea. Also known as Chemulpo, it stands on the W. coast, 30 m. by rly. W.S.W. of Seoul. It exports rice, beans, and hides. Pop. 102,473.

Jipijapa. Town of Ecuador. Situated in Manabí province 80 m. N.W. of Guayaquil, it is famous for the manufacture of the finest "Panama" hats. Pop. 6,000.

Jirón. Town of Columbia, in the dept. of Santander. It stands on a tributary of the Magdalena, 6 m. by rly. S.W. of Bucaramanga. In a gold-mining district, it also produces tobacco, coffee, cocoa, cattle, and quinine. The town was founded by the Spaniards in 1631.

Jitomir. Town in the Ukraine S.S.R. which became better known to the West in the Second Great War as Zhitomir (q.v.).

Jitterbug. One of the partners in a frenzied dance imported from

America, which is characterised by complicated body movements and grotesque gestures performed with no small degree of skill to stimulating jive (q.v.) music. In its mildest manifestation it consists of an alteration of the usual ballroom foxtrot walk to a simple device of shifting the weight to the left foot on the first beat of the bar, and allowing the right foot to use the other three beats while coming slightly behind or in front of the left; then quickly shifting the weight to the right foot on the first beat of the next bar, and so on. At its wildest it becomes an exhibition of mass hysteria comparable with the dancing mania (q.v.) which infected Europe in the Middle Ages: girls and even men are lifted bodily by their partners and swung between the legs or thrown flat on the floor in a choreomaniacal frenzy.

Jiu. A river of Rumania, also known as the Schyl. It rises near the S. frontier of Transylvania, traverses Wallachia from N. to S., and enters the Danube 50 m. E. by S. of Widin, opposite Rahova, its length being 200 m. It came into prominence in the First Great War in the early campaigns between the Rumanian and the Austro-German forces, the Rumanian army attacking the Jiu valley in Hungarian territory in Aug., 1916.

Jiu-Jitsu. Variant spelling of Jujitsu (q.v.).

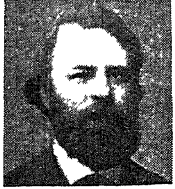
Jivaros or **JIBAROS**. S. American Indian tribe in the upper Maranon forests, Ecuador. Of Arawakan speech, they derived from the neighbouring Andean peoples their basketry, pottery, feathered tiaras, and their custom of preserving enemy heads by filling them with hot stones.

Jive. Originally a confusing double talk which arose from the polyglot patois of the Negro of Harlem, N.Y., designed to mystify outsiders and act as a defence mechanism against anti-Negro discrimination. Eventually the word was applied to the flashily pretentious jazz served up for jitterbug (q.v.) dancing, consisting of riffs (musical clichés repeated mechanically *ad lib*) interspersed with screaming trumpet and saxophone exhibitions, with the beat emphasized by clashing cymbal. Sometimes this is known as jump music. Jive is applied to dancing as a synonym for jitterbug.

Joab. Nephew of David. Made a general of the army of Judah, he became commander-in-chief and one of the king's most intimate counsellors. On David's death he

supported the claim of Adonijah to the throne, and he was executed by order of Solomon (2 Sam. 2; 1 Kings 2).

Joachim, JOSEPH (1831-1907). Hungarian violinist. Born at Kittsee, near Pressburg (Bratislava), June 28, 1831, he studied at Vienna and Leipzig. He appeared in public when only 12, met Mendelssohn, and the next year played at concerts in London. Leaving



Joseph Joachim, Hungarian violinist

Leipzig, he held posts at Weimar and Hanover, and in 1868 settled in Berlin as head of a branch of the Royal Academy of Arts, remaining there until his death, Aug. 15, 1907. In 1869 he organized a famous string quartet. He was the greatest violinist of his day, a successful teacher, composer of the Hungarian concerto for his instrument, and a friend of Brahms, whose music he played with special authority.

Joad, CYRIL EDWIN MITCHINSON (b. 1891). A British philosophical writer and broadcaster.

Born Aug. 12, 1891, he was educated at Blundell's and Balliol, Oxford, where he was John Locke scholar in moral philosophy; and entering the board of trade in 1914, served there and at the ministry of Labour until 1930, when he was appointed head of the department of philosophy at Birkbeck College, London.

Not himself an original or speculative philosopher, Joad excelled at expounding the systems of great thinkers. He revered both Plato and Aristotle, blending the former's conception of the Good with the idea of a Life Force. In lucid and honestly personal writings, Joad revealed the temperament of an epicurean. While insisting on a common sense approach to social and political questions, he never feared to

put an unconventional point of view and condemned much in the



C. E. M. Joad, British philosophical writer



Joan. Woodcut representing Pope Joan, from the MS. of the Nuremberg Chronicle

trend of civilization—ugliness, militarism, excessive use of the machine. At first a sceptic, he later turned towards Christianity. Best known of his early books were *Guide to Modern Thought*; *Mind and Matter*; *Good and Evil*; *Philosophical Aspects of Modern Science*. Under the Fifth Rib was "a belligerent autobiography." The Book of Joad and The Testament of Joad contained thought-provoking essays; Diogenes, and The Horrors of the Countryside, were witty commentaries. An original member of the B.B.C. Brains Trust, Joad became a popular celebrity. His quips, long impromptu summaries, and facility in giving the classical source of an opinion, were widely enjoyed.

Joan (1328-85). English princess called the Fair Maid of Kent. She was the second daughter of Edmund of Woodstock, earl of Kent, the sixth son of Edward I, and first married Sir Thomas Holland (d. 1360). In 1352 she became in her own right countess of Kent and Lady Wake of Liddell. On Oct. 6, 1361, she married the Black Prince at Lambeth, and during 1362-71 was in his dominions of Aquitaine. She died at Wallingford, Aug. 7, 1385, and was buried at Stamford. Richard II was her son.



Joan of Arc. Sword and breastplate said to have been worn by the Maid. These relics were exhibited at Westminster Cathedral in 1920

Joan. Mythical woman pope of the 9th century. According to a legend persistent for several hundred years, she was an English girl who went disguised as a man from Metz or Cologne to Rome with her lover, a monk. Having studied theology, she became pope, under the name of John VIII, her pontificate lasting from 853 to 855. While pope she is supposed to have given birth to a child. The legend was exploded in 1863 by Döllinger in his *Papal Legends of the Middle Ages*. See also Pope Joan.

Joan of Arc (1412-31). French heroine and saint. Jeanne d'Arc was a peasant maiden of Domrémy, Vosges, born Jan. 6, 1412. In 1428 the British and their Burgundian allies were in possession of all the N. provinces except Brittany, and laid siege to the town of Orléans. Joan persuaded the local commander to let her go to the king. Charles VII was at Chinon when she was conducted to his presence, and she is said to have picked him out from a crowd of courtiers.

Herself convinced by heavenly visions and the voices of SS. Catherine and Margaret that a divine mission had been laid upon her to deliver France, her obvious sincerity and perfect faith convinced also those who saw and heard her. She demanded a troop of soldiers to relieve the beleaguered city. The troop was given her; at its head she rode in arms to Orléans and entered it. Her fervour and faith imparted themselves to the garrison; led by her, they drove the English from post after post, April-May, 1429. Her followers took her to be a messenger from God; the panic-

stricken English swore that she was in league with the devil. But the Maid forced them to raise the siege, and then through the heart of a hostile country she led the king himself to Reims, where he was crowned, July 16.

She deemed her work done, and would have retired; but her services were too valuable, and she was retained. The Maid's inspiration breathed a new life into the soul of the French people, though the king's entourage feared her influence, which was by no means consonant with their own. Her spell was broken when she failed in

an attempt to enter Paris. Yet at the head of a small and devoted band she threw herself into Compiègne, which had declared for King Charles and was now being besieged by the Burgundians. From the town she headed an unsuccessful sortie; the gates were closed while she was still outside, and she was captured, May 23, 1430, by the Burgundians, who sold her to the English. Joan was



Joan of Arc. Sketch from life made at her trial by the scribe in the margin of his procès verbal Archives Nationales, Paris

tried on charges of heresy, witchcraft, blasphemy, impropriety, and disobedience by a court of ecclesiastics, nearly all French. Since she persisted in her stories about visions and the heavenly voices which directed her, the court condemned her as a heretic and a witch. In palliation of the court, it must be remembered that by the standards of the age Joan had certainly incurred penalties. She died by fire at the hands of the English in the market-place of Rouen, May 30, 1431. She was canonised in 1920, and her festival is May 30. See Charles VII; Hundred Years War; Orleans, Siege of.

Bibliography. Life, Anatole France, 1907; The Maid of France, A. Lang, 1908; Jeanne d'Arc, G. Hanotaux, 1911; Saint Joan (play) Bernard Shaw, 1923; Joan of Arc, H. Belloc, 1929; Trial, ed. W. P. Barrett, 1931; S. Joan of Arc, V. Sackville-West, 1936; The Saint and the Devil, F. Winwar, 1948.

João Pessôa. Capital of the Brazilian state of Parahyba, by which name it is also known. It is on the estuary of the Parahyba, having an outpost at Cabedello, 14 m. downstream. There is rly. connexion with Natal to the N. and Pernambuco to the S. The lower town is the commercial quarter and contains the 17th cent. cathedral. Pop. 101,280.

Joash or **JEHOASH.** King of Israel, son and successor of Jehoahaz. He reigned 797-781, and won three notable victories over Benhadad, king of Syria. He also reduced Judah into subjection to Israel (2 Kings 13).

Joash or **JEHOASH.** King of Judah. Youngest son of Jehoram, he escaped from the massacre by Athaliah, and was crowned in his seventh year. He abolished Baal worship, and reorganized the Temple worship, but he later was responsible for the murder of Zechariah. After reigning from 836 to 796 he was assassinated by two of his servants (2 Kings 11).

Job. Hero of one of the books of the O.T. It is probable that there existed in pre-Exilic times a legend of a righteous man who suffered undeserved calamities. Job is mentioned in Ezek. 14, vv. 14-20 as, with Noah and Daniel, a proverbially righteous man, and the prose prologue and epilogue of the Book of Job probably represent the original story. Job is righteous and prosperous, with seven sons and three daughters and great flocks and herds. At an assembly in Heaven, Satan asks "Doth Job fear God for nought?" and receives permission from God to test him. As a result, all his sons and daughters are killed, he loses his possessions, and is finally attacked by a loathsome disease (probably leprosy). His wife urges him to curse God and die, and his three friends, Eliphaz, Bildad, and Zophar, come to sympathise and probably give the same advice. But his loyalty to God remains unshaken, and eventually his prosperity is restored twofold; his friends are rebuked by God, and he is ordered to pray for them.

This early legend was used by a later author, writing probably in the 4th cent. B.C., for a discussion of the problem of pain. In poetical form, it consisted originally, after an introductory speech by Job, of speeches by each of his three friends in turn, followed by one from Job, the cycle being repeated three times (in the form in which we now have the book, the final speech of Zophar has been omitted) and being closed by the appearance of God in a whirlwind. The argument progresses only in the speeches of Job. The friends merely state, with increasing emphasis, that suffering can come only as the result of sin. Job is at first merely bewildered by what has occurred; his speech in chap. 3 is a cry of agony; then he is sustained for a moment by the

hope that God must be perfect, but this hope fails and he is convinced that the grave will be his end. He makes the tremendous move forward to the assurance that justice will be done beyond the grave (chap. 19). But the problem of why God should allow undeserved suffering is still unsolved. Job challenges God, Who appears in a whirlwind; chaps. 38-41 are a tremendous description of His power. Job abhors himself and repents for his presumption.

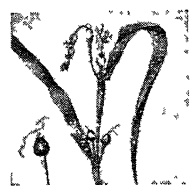
This, then, is the poet's answer to the problem: God is almighty, and no man has the right to question His actions; man's part is only to worship and obey. But someone, feeling there was more to say, inserted the speeches of Elihu, a fourth friend (chaps. 32-37), which begin and end abruptly, and have no influence on the argument. Elihu's thesis is that Job's righteousness is illusory, since self-righteousness is itself a form of sin; and his sufferings are intended to convince him of this.

The poetical part of the book is in difficult Hebrew, and the translation of A.V. and R.V. is more than doubtful. The book represents a vital stage in the development of Jewish theology, and the language rises to great heights of poetry. Consult The Book of Job Interpreted, J. Strahan, 1913; The Book of Job, C. J. Ball, 1922.

Jobber. Name given to a dealer in stocks and shares. He deals with brokers and only through them with the general public. The jobber's "turn" is the difference between the buying and selling price of a stock or share, which forms his remuneration, or part of it. See Broker; Stock Exchange.

Job's Comforter. Term applied to one who, under pretence of sympathy, makes cruel criticisms. It refers to Eliphaz, Bildad, and Zophar, in the Book of Job, who, coming to condole with the righteous man in his calamities, suggest that his affliction is the consequence of his own offences.

Job's Tears (*Coix lachryma*). A grass of the family Gramineae, native of India. It has leafy stems, 3 ft. or 4 ft. high, the leaves



Job's Tears, an Indian grass

broad and drooping. The name is suggested by the large, hard, pearly-grey seeds which hang in clusters from the upper parts of the stems

Jocasta OR EPIKASTĒ. In Greek legend, wife of Laius, king of Thebes, and mother of Oedipus. How, on the death of Laius, she unwittingly became the wife of her own son, and bore him children is told under Oedipus. Overwhelmed with horror when she discovered what had happened, Jocasta hanged herself.

Jocelin of Brakelond (d. c. 1213). An English chronicler. A Benedictine monk of Bury St. Edmunds, he was the author of a chronicle written in Latin and containing a detailed account of the monastic life, 1173-1202, and a striking presentation of the abbot, Samson. The chronicle (ed. J. G. Rokewode, 1840, new ed. 1905, Eng. trans. T. E. Tomlin, 1844) inspired the second book of Carlyle's *Past and Present*.

Joch Pass. Alpine bridle-path of Switzerland. It is in the canton of Bern, leading from Meiringen to Engelberg, N. of the Jochstock and the Titlis, and reaching an alt. of 7,265 ft. It traverses the Engstlen Alp, near the Joch glacier, and runs past the Engstlen and Trübsee lakes.

Jock Column. Mobile column of mixed arms used by British Imperial forces in the Libyan desert campaigns of 1941-42. Their creation was due to Gen. Auchinleck, but they took their name from Brig. (later Maj.-Gen.) "Jock" Campbell, V.C., who commanded them with conspicuous success. Usually under a brigadier, a typical column included motorised infantry, field guns, anti-tank and light A.A. guns, tanks, and reconnaissance cars. It might take ammunition, petrol, supplies, and water for a week. Jock columns, especially effective in harrying the enemy during pursuit and in carrying out offensive patrols, are to be distinguished from the Long Range Desert Group (*q.v.*). See *North Africa Campaigns*.

Jockey. One who rides in a horse race. The training of a professional jockey begins with apprenticeship to a licensed trainer for not less than three years. The apprentice jockey is permitted by the rules of racing to ride in public, and in certain events is entitled to an allowance of 7 lb. until he has won six races; thereafter 5 lb. until he has won 25; thereafter 3 lb. until he has won 40. The allowances cannot be claimed by an apprentice more than 23 years of age. All apprentices and full jockeys require a licence, renewed annually, from

the stewards of the Jockey Club, or the National Hunt committee for steeplechase riding.



Jockey. The English champion jockey, Gordon Richards

Unless the jockey rides under a special agreement for a lesser amount, the fee to a winner on the flat is 7 gns. and to a loser jockey 5 gns. National Hunt rules provide for the payment of 5 gns. for winners and 3 gns. for losers in races below the value of 85 sovs.; for other races the fees are 10 gns. and 5 gns. respectively. In addition, many jockeys are paid a retaining fee and frequently receive gifts for winning. Most flat-race jockeys are professionals; but many amateurs ride under National Hunt rules, the higher scale of weights, minimum 9 st. 7 lb., providing them with more opportunities. On the flat 6 st. 7 lb. is the lowest weight allotted (apprentices, minimum 6 st.). See *Horse Racing*.

Jockey Club. The governing body of horse racing in Great Britain. It was founded in 1750 for, *inter alia*, framing rules to govern flat races, arranging annual fixtures, granting licences to officials, trainers, jockeys, and racecourses, and sitting in judgement on any person reported to the stewards for malpractices. It has no charter, but its power in racing

affairs is paramount; wrongdoers disregarding its sentences may be legally proceeded against. The usual punishment is to warn the offender off Newmarket Heath, or permanently or temporarily to suspend a licence. Fines not exceeding £100 may be imposed by the stewards. The club does not take cognizance of disputes or claims with respect to bets, but will give effect to an official report by the committee of Tattersalls, which deals with these matters.

Candidates for membership are elected by ballot, the subscription being £10 on election, with £10 payable on the first day of each succeeding year. There are three stewards, the senior of whom retires at the annual financial meeting and nominates his successor. The National Hunt committee, the Turf Club of Ireland, the Irish National Hunt Steeplechase committee, the Channel Islands Racing and Hunt Club, and the French, Belgian, and Australian Jockey Clubs have a reciprocal agreement with the Jockey Club for the mutual enforcement of sentences passed on offenders.

Jodelle, ÉTIENNE (1532-73). French poet and dramatist. Born in Paris of noble birth, being sieur of Limodon, he was a member of the Pléiade, and known especially in that group for his work in poetic drama. In 1552 his tragedy of Cléopâtre Captive was first played, an event usually taken to mark the foundation of the classical French tragedy. His success was liberally rewarded by Henry II, and his second tragedy, *Didon*

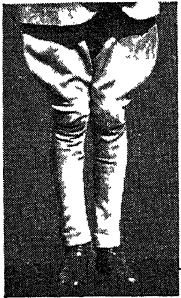


Jodhpur. The mountain fortress and maharaja's palace on an isolated rock above the town. See entry in next page

Se Sacrifiant, followed soon after. Among his other works may be mentioned a five-act comedy, Eugène, and his poem, Aux Cendres de Claude Colet. His collected works appeared in Marty-Laveaux's collection of La Pléiade Française, 1868-70.

Jodhpur OR MARWAR. Former state of India, now a part of Rajasthan. Its area is 36,120 sq. m., and pop. 2,555,904. Millet, maize, and cotton are among the chief crops. Salt and sandstone are found. The exports include salt, hides, cotton, and oilseeds; imports are piece goods. The ruler was a maharaja, entitled to a salute of 17 guns. Jodhpur is the capital; founded in 1459 by Rao Jodha, it contains many notable buildings and is a commercial centre. It acceded to the dominion of India, in Aug., 1947. Pop. 154,000. See illus. in preceding page.

Jodhpurs. Riding breeches of a pattern first worn by native horsemen in India. Looser in cut



Jodhpurs, type of riding breeches

than the orthodox breeches, instead of lacing below the knee they reach the ankle, where they generally have a turn-up. They are now a days worn by women as well as by men.

Jodl, ALFRED (1890-1946). German soldier, born at Aachen (Aix-la-Chapelle). Jodl joined an artillery regiment in 1910, and served during the First Great War in the front line, and was a staff captain by 1918. When Hitler took power, Jodl was promoted colonel and made head of the operational department of the high command. Major-general in 1939, he was raised to chief of staff of the high command, personally attached to Hitler and, technically under Keitel, the highest authority on strategy. In 1942 he received the rank of colonel-general. Taken prisoner at Flensburg in May, 1945, Jodl was found guilty of war crimes, crimes against peace and humanity, and con-



Alfred Jodl, German soldier

spiracy to wage aggressive war at the Nuremberg trial, and was executed Oct. 16, 1946.

Joel. A minor prophet of the O.T. His book, written c. 500 B.C. or later, is inserted between the books of Hosea and Amos. He belonged apparently to Judah, was the son of Pethuel, and lived in Jerusalem. He uses the plague of locusts as symbolical, deals with divine judgement, and calls for repentance, pointing out the way of salvation for Judah. He is quoted in Acts 2 and Romans 10. The name is that of the elder son of Samuel, occurs ten times in 1 Chron., and was that of one of the sons of Nebo (Ezra 10) and of the son of Zichri (Neh. 11).

Joel, SOLOMON BARNATO (1866-1931). A British Jewish financier. Nephew of Barnett Barnato, he joined him in business enterprises in S. Africa. As a member of Barnato Bros., the bankers, and director of De Beers and other diamond and gold mining firms, he made a huge fortune. Known for his interest in racing and yachting, he won the Derby at Newmarket in 1915 with Pommern. He died May 22, 1931. It was his brother, J. B. Joel (1862-1940), whose Sunstar won the 1911 Derby.

Joffre, JOSEPH JACQUES CÉSaire (1852-1931). A French soldier. Son of a wine merchant, he was born Jan. 4, 1852, at Rivesaltes, E. Pyrenees, went to school at Perpignan, and in the Franco-Prussian War served as second lieutenant of artillery at the siege of Paris. He transferred to the engineers and helped to build railways in Senegal and Indo-China. He later served with distinction at Timbuktu, 1893, and in Madagascar. In 1901 he was promoted general of brigade, in 1904 director of engineers, and in 1910 became a member of the supreme council of war. Next year he was selected as chief of the general staff and generalissimo in the event of war.

At the outbreak of the First Great War, Joffre's mobilisation plans worked smoothly, but he soon showed lack of adaptability to modern military conditions. Despite repeated warnings, he took no effective measures to meet the German flank attack through

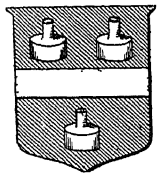
Belgium; N. France was soon exposed to German occupation. His calm courage and resolution stood him in good stead at the first battle of the Marne, which raised him to a peak of popularity, though Gallieni deserved much of the credit; but his offensives in trench warfare were unsuccessful, those of Arras in the spring of 1915 and Champagne in the autumn costing enormous casualties.

Joffre somewhat retrieved his reputation by measures to relieve Verdun and at the battle of the Somme. But the limited results deepened the discontent of the government, and in Dec., 1916, Joffre retired with the rank of marshal. He then engaged in advisory duties and missions on behalf of the Allies. His simple qualities and honesty endeared "Papa Joffre" to his troops, but his moral stature was far higher than his military ability. A distinguished mathematician, he was elected to the French Academy in 1918. He received the O.M. in 1919, and lived in retirement until his death on Jan. 3, 1931. A biography by R. Recouly appeared in that year, and the Marshal's Memoirs, 2 vols., in 1932.

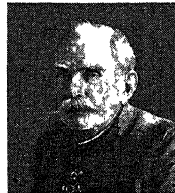
Johanna, ANJOUAN, OR N'ZUANI. Island off E. Africa, belonging to France. One of the Comoro group in the Mozambique Channel, it lies between Grand Comoro and Mayotte. Its area is 90 sq. m., and the pop. about 6,000. The chief town is Anjouan or Musamundu, the residence of the sultan.

Johannesburg. The largest city in Transvaal province and in the Union of South Africa. It covers 91 sq. m. and lies at an alt. of 5,760 ft., which gives it an invigorating climate. The average mean temp. is 60° F., annual rainfall 32½ ins., daily sunshine 8½ hours. The provincial capital, Pretoria, lies 43 m. N. by railway; Cape Town is 956 m. S.W., and the nearest port is Lourenço Marques, 395 m. The pop. in 1946 was 767,100, including 324,304 Europeans.

This city owes its site to the discovery of gold on the Witwatersrand; its name to a certain Johannes Meyer; and its development to public diggings begun in 1886, when it was virtually a mining camp. Near the world's greatest goldfields, it exists primarily for the mining,



Johannesburg arms



Marshal Joffre, French soldier

industry, the market value of gold from the Rand in a normal year

approaching £100 m. The S. part of the city is

literally built on gold. After mining came subsidiary industries: chemicals, cement, bricks, engineering, food stuffs, clothing, and furniture. Here are more diamond cutters than anywhere outside the Low Countries.

Administration is under [a council of 42 members. Electric power, gasworks, abattoirs, markets, transport, and an airport are municipal undertakings. Civic architecture is striking. There are playing fields, racourses, all facilities for sport, a zoological garden, and several parks and wild gardens. A cathedral and university city, Johannesburg possesses a public library, an art

gallery, symphony orchestra, opera season, an institute for medical research, a medical college, and observatories. These last—Union Observatory, Yale University Observatory, and Leyden Observatory—are of world-wide importance, their locations having been chosen because of the purity of the atmosphere and its freedom from fog.

Among the many govt. and other schools there are boys' schools conducted on the model of English public schools. Broadcasting was inaugurated in 1924, and the film industry flourishes here. Consult Fifty Golden Years of the Rand, D. Jacobson, 1936; History of the Discovery of the Witwatersrand Goldfield, E. L. and J. Gray, 1940; Out of the Crucible, A. Macmillan, 2nd edn., 1948.

Johannesburg Star, THE. One of the leading daily newspapers of South Africa. First published at Johannesburg in 1887, it was taken over two years later by the Argus Printing and Publishing company. It is devoted chiefly to the gold mining, agricultural, and general interests of Transvaal province.



Johannesburg. Plan of the mining city on the Rand



Johannesburg, South Africa. 1. Russik Street, one of many mile-long thoroughfares; in the background can be seen the gold mine dumps. 2. City Hall, Market Square, to which a storey has been added since it was built in 1915. 3. Colosseum Film Theatre. 4. Public Library and Market Square Gardens

Courtesy of South African Railways

Johannisberg. Village of Germany, famous because of the wine named after it. It is on the right bank of the Rhine, in the former province of Hesse-Nassau, 6 m. by rly. E. of Rudesheim. On the hills around are vineyards from which the wine is produced. There was a Benedictine monastery here in the Middle Ages.

John. A masculine Christian name. Of Hebrew origin, it means grace of the Lord, and is probably the most popular of all Christian names. Forms are the Scottish Ian, Irish Sean or Shaun, Welsh Jenkin, and Russian Ivan. Jean is the French, Johann the German, Giovanni the Italian, Juan the Spanish form. Jack and Jock are nick-names. There are many feminine forms, including Johanna or Joanna, from which come Jane and Janet, or little Jane, Joan, and Jean.

John. Saint and apostle. The son of Zebedee and Salome, a sister of Mary, the mother of Jesus, he was a master fisherman on the Sea of Galilee, came under the influence of John the Baptist, and, with his brother James, was among the earliest of the followers of Christ. One of the youngest of the Twelve, he was also one of the most zealous and one of the most eloquent. The zeal of John and James won for them the name of Boanerges (*g.v.*), sons of thunder.

John was present at the Last Supper, and at the trial of Jesus before the Sanhedrim and before the Roman procurator. He stood by the Cross, and into his care Jesus committed His mother (Matt. 4 and 20; Mark 1, 3, 9, 10; Luke 9 and 22; John 13; Acts 3, 4, and 8; Rev. 1). According to tradition, after the death of Mary, John settled in Ephesus and lived to a great age. His festival, Dec. 27, S. John the Evangelist's Day, has been observed since the 6th century. See John, Epistle of; John, Gospel of; Revelation, The Book of.

John THE BAPTIST. Christian saint, and last of the O.T. prophets. Son of Zacharias and Elisabeth, both of the priestly race, his mother being a relative of the Virgin Mary, he was born in Judea. Ordained from his birth to be a Nazarite, he lived in the wilderness apart, feeding mainly on locusts and wild honey, and wearing a rough garment of camel's hair.

John soon began to preach, prophesying that the kingdom of Heaven was at hand, proclaiming the coming of Christ, calling the people to repentance, denouncing the Pharisees and Sadducees, and practising baptism as an outward symbol of repentance. Among those whom he admitted to this

rite was Jesus, whom he pointed out as the Christ and the Lamb of God. Herod was moved by his preaching, but when John reproved the tetrarch for his unlawful marriage, he was cast into prison, and later beheaded (Matt. 3, 11, 14, and 21; Mark 6, 9, and 11; Luke 1, 3, and 7; John 1 and 3; Antiq. of the Jews, Josephus,



S. John the Divine, from the plaque by Della Robbia, Santa Croce, Florence

xviii, 5). His birth is commemorated on June 24; his beheading is a black letter day (Aug. 29). See Herod Antipas; Herodias; Icon.

John. Name of 23 popes. John I, pope 523-26, died in prison under Theodoric the Ostrogoth. John II was pope 532-35; John III 560-74; John IV, a Dalmatian, 640-42; John V, a Syrian, 685-86; John VI, a Greek, 701-5;

John VII, a Greek, 705-7; and John IX, an Italian monk, 898-900.

John X, of Ravenna, pope 914-28, led the Italian princes against the Saracens and defeated them at the river Garigliano in 916. His alliance with Hugh of Burgundy offended the margrave of Tuscany, and the pope died in prison at Rome. John XI, of Tuscany, pope 931-36, was the nominee of his mother, Marozia, wife of the margrave of Tuscany.

John XIII, a Roman noble, pope 965-72, allied himself with the emperor Otto II, and developed the hierarchy in Germany and Italy. John XIV, pope 983-84, was thrown by the anti-pope Boniface VII into prison, where he died. John XV, pope 985-96, was the first pontiff to canonise saints. John XVI, archbishop of Piacenza, was an anti-pope 997-98, created by Crescentius, and deposed by Gregory V. John XVII, pope 1003, John XVIII, pope 1003-9, and John XIX, pope 1024-33, were all nominees of the Roman house of Crescentius. John XX (XXI), pope 1276-77, was the author of a text-book on logic.

John VIII (d. 882). Pope 872-882. Elected pope when archdeacon of Rome, his efforts were chiefly directed to the conversion of the Slavs and the avoidance of a breach with the Eastern Church.

On the death of Louis II, 875, the pope used his influence to secure the imperial crown for Charles



John the Baptist preaching to the multitude. From the fresco by Andrea del Sarto in the Chioostro dello Scalzo, Florence

the Bald, on whose death in 877 John promoted the cause of Charles the Fat, whom he crowned as emperor in Feb., 881. At Rome the pope was harassed by his lifelong enemy, the future pope, Formosus, bishop of Porto. John finally succeeded in driving his enemies out of Rome, and Formosus was forced to sign a declaration that he would not return (878). In the same year Rome was seized by Lambert, duke of Spoleto, whereupon John retired to France. He died Dec. 16, 882.

John XII (c. 937-964). Pope 955-964. Octavius, only son of Alberic the younger, was elected pope at the age of 18 on the death of Agapetus II. To gain help against Berengarius, king of Italy, the pope, who took the name of John, made alliance with the German king Otto, whom he crowned emperor Feb. 2, 962. But John could not keep faith, and secretly treated with the enemy.

In the absence of John, a synod was held, Nov. 6, 963, in which the pope was accused of various crimes, and on Dec. 4 was declared deposed, a layman being crowned pope as Leo VIII. A counter-revolt enabled John to return and to execute savage vengeance on his enemies. Shortly after excommunicating Leo and his adherents he died of paralysis, May 14, 964.

John XXII (1249-1334). Pope 1316-34. Born at Cahors, his name being Jacques d'Esse, he became



John XXII,
Pope 1316-34

bishop of Fréjus in 1300, of Avignon in 1310, and cardinal in 1312. Elected pope in 1316, he took up his residence at Avignon. The main events of his pontificate were the long conflict with Louis of Bavaria and the establishment of the papal see on French soil. Louis replied to the papal claims over Germany by supporting John's opponents in Italy, a policy which resulted in the excommunication of Louis by John, March 23, 1324. John died Dec. 4, 1334.

John XXIII (c. 1370-1419). Anti-pope during the Great Schism. Born of a Neapolitan family, Baldassare Cossa entered the Roman Curia and in 1402 was created cardinal. In 1410 he was chosen as pope of the Pisan party. In 1413, driven from Rome by the approach of Ladislaus, king of Naples, he went to Florence to seek the protection of Sigismund, king of Germany, who insisted that, to end the

schism, a general council must be convoked at Constance, and induced John to call one for Nov., 1414.

At the second session of the council John promised to abdicate; he then secretly fled, but was formally deposed. He was kept in confinement till the year following the election of an undisputed pope, Martin V, whom he acknowledged. Created cardinal-bishop of Tusculum by the new pontiff, he died at Florence Nov. 29, 1419. See Constance, Council of.

John (1167-1216). King of England. The youngest son of Henry II and his wife, Eleanor, he was



John,
King of England

born at Oxford, Dec. 24, 1167. In spite of the name of Lackland given to him in derision, his father made him rich gifts of land, both in England and France, while further possessions came to him when he was married to Isabella, heiress of the earl of Gloucester. In 1177 he was made lord of Ireland and he was sent to that country in 1185. Returning to England, he joined his brother, Richard, and Philip Augustus of France in their struggle against Henry II, and the story goes that this was the final blow that killed the king. During the earlier part of the reign of Richard, John plotted continuously against him. After 1194 the brothers lived on fairly friendly terms, and at Richard's wish John succeeded him as king in 1199.

John's reign was a period of disaster. He became involved in a war with France, a quarrel with the pope, and a dispute with his barons. The results were the loss of Normandy, the humiliation of the interdict, and the forced signature of Magna Carta. He had renewed the war against the barons when he died at Newark, Oct. 19, 1216. John has been regarded as the worst among English kings, false in every relation of life, but this is probably an exaggerated estimate, based upon one or two outstanding crimes, especially the murder of Arthur, and upon the national humiliation associated with his reign. He was undoubtedly a man of ability, which he showed both in politics and war. He divorced his first wife and married Isabella of Angoulême. He had two sons, Henry III and Richard, earl of Cornwall. An illegitimate daughter married Llewelyn, prince of N. Wales. See Magna Carta; consult John Lackland, K. Norgate, 1902.

John. Name of several East Roman emperors. Their numbers are variously given, according as some are included in or omitted from the list of rulers. Their surnames were Tzimisces, Comnenus, Ducas, Lascaris, Palaeologus, and Cantacuzene.

John CANTACUZENE (c. 1292-1383). East Roman emperor 1341-54, known as V or VI. After the death of Andronicus III, his widow acted as regent for his son John Palaeologus, then nine years old. But Cantacuzene, formerly minister and general of Andronicus, had himself proclaimed emperor in Thrace. On Feb. 6, 1347, he entered Constantinople, and was acknowledged as the colleague of the youthful Palaeologus. The empire was hard pressed. Civil war broke out again, and Cantacuzene committed the fatal mistake of calling upon the Ottoman Turks for assistance, which gave them a footing in Europe. Finding his unpopularity growing, he abdicated and retired to a monastery in Dec., 1354.

John (1296-1346). King of Bohemia. A son of the emperor Henry VII, he was born Aug. 10, 1296. First count of Luxemburg, a small county belonging to his father, he was chosen and crowned king of Bohemia in 1311. Disappointed at not succeeding Henry as emperor in 1313, and tiring of Bohemia, he passed the next few years fighting for his friends in various parts of Europe. He was useful to the Teutonic Order and the emperor Louis. Although by now blind, he was eager to help his relative, Philip of France, against the English, and was killed at Crecy Aug. 26, 1346. His son Charles became the emperor Charles IV, a result John did something to bring about. The story that he was the wearer of the crest of three ostrich feathers and the motto *Ich dien*, now that of the prince of Wales, is now discredited.

John I. King of France. The son of Louis X, he was born Nov. 15, 1316. His father having just died, he became king at once, but he only lived seven days. Later an impostor, claiming to be the dead child, appeared in France.

John II (1319-64). King of France, surnamed the Good. Born near Le Mans, son of Philip VI, he



John II,
King of France

succeeded his father in 1350. He fell into the hands of favourites and was probably responsible for the assassination of the high constable,

de Brienne. Early in his reign complaints were made by the provincial states of his extravagance, and in 1355 he was obliged to yield fiscal control to the states-general.

In 1356 John was defeated and captured by the Black Prince at Poitiers, and brought captive to England. In 1359 an agreement which he signed for his liberty was rejected by the states-general at Paris, and he did not return to France until after the Peace of Brétigny, 1360. His son, Duke Louis of Anjou, broke parole as his hostage, 1363, and early in 1364 John returned to an honourable captivity in London, where he died on April 8 in the same year. His body was buried at St. Denis.

John (1624-96). King of Poland; known as John Sobieski. Born at Olensko. Galicia, June 8, 1624, a



**John III,
King of Poland**

son of James Sobieski, the castellan of Cracow, he received a liberal education. In 1648 John Casimir appointed him captain of his guards. He took part in the campaign against the Cossacks and Tartars in the Ukraine in 1651, and served under Czarniecki when repelling the Swedish invasion of Poland in 1655. In 1665 Sobieski became grand marshal of Poland, and in 1667 commander-in-chief.

John Casimir abdicated in Aug., 1668, and the incompetent Michael Wisniowiecki was elected king June 19, 1669. Instigated by the Porte, Cossacks and Tartars advanced into Podolia and captured Kamieniec. The king was compelled to purchase peace by the treaty of Buczacz, Oct. 17, 1672, whereby he ceded the Ukraine with Podolia and Kamieniec. Hereupon Sobieski, marching with an army of some 30,000 men, destroyed the main Turkish host at Khotin, Nov. 10, 1673.

On that same day King Michael died. When the diet opened in April, 1674, Sobieski appeared at the head of a formidable retinue and secured his own election as king, May 21, 1674. He immediately proceeded to the Ukraine, where the Turks were in the field. Though immensely outnumbered, his brilliant generalship brought the campaign to a successful conclusion, and after a series of defeats the Turks made peace at Zaravno, Oct. 16, 1676, yielding back to Poland the whole of the Ukraine on the Polish side of the Dniester.

For seven years Sobieski remained aloof from European quarrels. In 1683, however, he entered into an alliance with the emperor Leopold to drive the Turks from the Polish and Austrian borders, and engaged himself to march to the relief of Vienna if attacked. Vienna was invested on July 14 by an immense Turkish army. On Aug. 31 Sobieski joined the duke of Lorraine, crossed the Danube on Sept. 10, and on the 12th annihilated the Turkish host. The relief of Vienna was followed by the complete liberation of Hungary. The latter years of his reign were disturbed by intrigues at home. He died of apoplexy, June 17, 1696.

John (1545-78). Spanish soldier, known as Don John of Austria. Born at Ratisbon, Feb. 24, 1545, he was the son of Charles V and Barbara Blomberg, a native of that city. His early life was passed in Spain, and in 1559 his half-brother, Philip II, carrying out the emperor's wish, made him a member of the royal family. He was appointed to command a fleet sent against the Mediterranean pirates, and later served in Granada.

**John of Austria
(1545-78)**

In 1571 John was in command of the fleet that crushed the Turks at Lepanto, the feat which immortalised his name. He made one or two attempts to secure for himself a kingdom, either on the African or the European shore of the Mediterranean, but these failed. He was sent in 1576 as governor-general to the Netherlands, where, however, he was not very successful; he was forced to make concessions by which William of Orange became the real head of the government.

Don John soon renewed the war, won a victory at Gembloux in 1578, and scored other successes. On Oct. 1, 1578, he died of fever. It was said, probably wrongly, that he was poisoned by order of Philip II. See Lepanto; consult Don John of Austria, W. Stirling-Maxwell, 1883; G. Slocombe, 1935.

Another Don John (1629-79) was a natural son of Philip IV of Spain and an actress, Maria Calderon. Recognized as a prince, he saw a great deal of military service, and after the death of his father in 1665 was made viceroy of Aragon and later prime minister. He died Sept. 17, 1679.

John, EPISTLES OF. Three epistles in the N.T. All written in a style resembling that of the

fourth Gospel, they are attributed to S. John. It is usual to group together the fourth Gospel, the three Epistles of John, and the Book of Revelation as the Johannine writings. The problem of authorship concerns all of them. Papias, speaking of the discourses of the elders, refers to two disciples of the same name, John (evidently the apostle) and the elder John (or the presbyter John). It is, therefore, not certain which John is intended as the author of the various Johannine writings.

The first Epistle discusses heretical doctrines of a Docetic character, according to which Jesus's human nature was not real but only apparent. It is so closely related to the fourth Gospel that the author must have been the same—probably John the apostle.

The second Epistle claims to be written by "the Elder" (or "the presbyter"), and it has been held that this means no ordinary elder, but the famous apostle. It is addressed to "the elect lady and her children." Is "the elect lady" a Church or an individual? If a Church, the Church of Pergamum in Asia has been suggested; but the tone of the letter rather indicates an individual.

The third Epistle, addressed to a certain Gaius, also claims to be written by the Elder (or the presbyter), and is closely related to the second. If the apostle wrote the three Epistles, the style and the character of the subject matter, which seem to imply a rather late date, are accounted for by supposing that they were written towards the end of a long life. See Bible; New Testament; consult Johannine Epistles, C. H. Dodd, 1946.

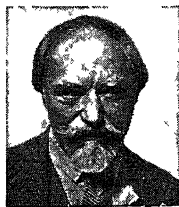
John, THE GOSPEL OF. Book of the N.T. It is an attempt to justify Christianity from the historical facts connected with the career of Jesus. There is serious controversy on the question of its authorship. The conservative position maintains, on the ground of tradition and internal evidence, that the Gospel was written by John the apostle. An increasing number of scholars maintain that it was composed by a disciple of the apostle—a member of the Johannine school—who embodied material which came from John himself. A few (Harnack, Bousset) hold the view that the Gospel is not the work of John the apostle but of John the presbyter, one of the secondary figures in the sub-apostolic age.

Wendt maintains that, like the synoptics, the fourth Gospel was compiled from different sources, one of which consists of the prologue and the speeches of Christ,

while the second comprises the historical framework. He thinks that the first source is Johannine, and therefore trustworthy, while the second is of considerably less value. The most advanced school denies that the Gospel has any connexion at all with John or the apostolic age, and thinks that it was written by an unknown Christian, who was possibly connected with Alexandria or Ephesus, c. 140. This Gospel is in content and style more apart from the other three than they are unlike one another. *See Bible; Criticism, Biblical; Gospels, the Four; New Testament.*

John, EVE of S. Midsummer Eve (June 23), the vigil of the Nativity of S. John the Baptist. Of the ceremonies once performed in his honour on this date the best known is the placing of branches of trees over the house-doors, perhaps in allusion to the predicted rejoicing at his birth.

John, AUGUSTUS EDWIN (b. 1878). A British painter. Born at Tenby, Jan. 4, 1878, he studied at the Slade school under Tonks until 1898, and in 1901 taught at Liverpool university. A leading member of the New English art club, he was elected A.R.A. in 1921



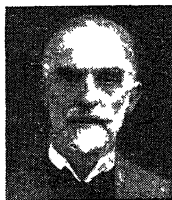
Augustus John,
British painter

and R.A. in 1928. He resigned in 1938 on the rejection of Wyndham Lewis's portrait of T. S. Eliot, but was re-elected in 1940. A trustee of the Tate Gallery 1933-41, he received the O.M. in 1942.

John's work may be divided into four groups: portraits, gipsy scenes, landscapes, and etchings. Early influenced by the Italian primitives, he became famous as a portrait painter. Two most characteristic works, *The Smiling Woman*, and the portrait of Mme. Suggia, in the Tate Gallery, are brilliant examples of bravura. He imbued his sitters with classic pose and tone, and for many years his pictures were a synthesis of the grand manner of the Quattrocentists. His unmistakable style of painting was broad, sometimes almost rough, displaying little patience for inessential detail. It was always vital and full of power. He had a masterly sense of design, and in his etchings (32 of which were presented to the Fitzwilliam Museum, Cambridge) was influenced by Goya. His works are

in galleries in Paris, New York, and Liverpool. Biographies by C. Marriott, 1917; A. Bertram, 1923; J. Rothenstein, 1944.

John, SIR (WILLIAM) GOSCOMBE (b. 1860). British sculptor. Born at Cardiff, the son of a wood-carver, he studied under Dalou at the Lambeth, at R.A. schools, and in Paris. He also travelled in Italy, Spain, and the East. He became A.R.A. 1899, R.A. 1909, and was knighted 1911. His *Boy at Play* is in the Tate Gallery; and among numerous statues and memorials may be cited those of Edward VII (Cape Town); Sullivan (S. Paul's); Lloyd-George (Carnarvon); Lord Salisbury (Westminster Abbey); Coldstream Guards (S. Paul's).



Sir Goscombe John,
British sculptor
Russell

John Bull. The name used as a personification of the English nation, and for the typical Englishman. The name and character were first popularised in 1712 by John Arbuthnot, the friend of



John Bull, depicted
by Sir John Tenniel
Courtesy of the
proprietors of Punch

Swift and Pope, in the *History of John Bull*, a series of pamphlets attacking the Whig war policy. In this satire the strife of the nations is depicted in the guise of a lawsuit, in which France appears under the name of Lewis Baboon (Bourbon), Spain as Lord Strutt, and the Low Countries as Nicholas Frog, who ambitiously attempts to equal John Bull in size.

John Bull's Other Island. Satirical comedy by Bernard Shaw. It was produced at the Court Theatre, London, Nov. 1, 1904. In the persons of the sentimental, tactless, muddle-headed Broadbent, and the clever but ineffectual realist Doyle, English and Irish characteristics are brilliantly contrasted. The play was written at

the request of Yeats, and in its published form is preceded by a Preface for Politicians, in which Anglo-Irish relations are analysed.

John Company. Name for the Honourable East India Co. (*q.v.*).

John George I (1585-1656). Elector of Saxony. Born March 5, 1585, he succeeded his brother Christian II as elector in 1611. Although a Lutheran, he showed at first R.C. sympathies, and vacillated between the emperor Ferdinand and the Protestant princes. At length he became an ally of Gustavus Adolphus, but deserted the Swedes after Lutzen in 1632. The latter attacked him, and he was forced to sign humiliating treaties in 1635 and 1645. He died Oct. 8, 1656, and was succeeded by his son, John George II.

John Halifax, Gentleman.

Novel by Dinah Maria Mulock (Mrs. Craik), published anonymously in 1856. Generally regarded as the best of her stories, its sincerity of tone, in the delineation from boyhood to age of one who is a Christian gentleman without ever degenerating into a prig, has given it a place among the classics of domestic fiction.

John Inglesant. A historical romance by J. H. Shorthouse. Completed in 1876, it was kept by its author in MS., but 100 copies were printed in 1880. One of these was read by Mrs. Humphry Ward, who recommended it to Alexander Macmillan, the publisher. Then 9,000 copies were sold within 12 months. The book attracted the attention of Gladstone, Huxley, and Manning, and made its author's name. It sets out to express, in the life of a Caroline courtier, the differing ideals of the Jesuits and their opponents, "the religion of authority and the religion of the spirit."

John Llewelyn Rhys Memorial Prize. British literary award founded in memory of a Hawthornden (*q.v.*) prizewinner, who was killed on active service with the R.A.F. in 1940. The capital fund was collected from Rhys's literary earnings and produces an annual sum of £25, which is awarded to the author of a work notable in achievement or promise. To be eligible for the prize writers must be under 30 and citizens of the British Empire.

John of Bologna (1524-1608). Italian sculptor. Born at Douai, he studied under Jacques Beuch, and then worked for two years at Rome under Michelangelo. Having obtained the patronage of Cosimo and Francisco de' Medici, he out-

stripped all rivals, and finally became official sculptor to the Florentine court, which post he retained till his death. Among his works may be cited Samson and the Philistines, Rape of a Sabine Woman, and an emblematic group of Florence Victorious.

John of Brienne (c. 1148–1237). King of Jerusalem and East Roman emperor. He probably took part in the fourth crusade, and in 1210 married Mary (d. 1212), heiress of the kingdom of Jerusalem. As titular king of Jerusalem he led an expedition which captured Damietta, 1219, and, returning to Europe, married Berengaria of Castile in 1223. In 1225 his daughter Isabel married the emperor Frederick II, who forthwith claimed the kingdom of Jerusalem. In 1229 John was chosen emperor at Constantinople. After a gallant defence of his city against the infidel in 1235, John died there as a Franciscan friar, March 23, 1237.

John of Damascus (c. 676–754). A Father of the Eastern Church, called Chrysorrohoas (gold-en-flowing) from his eloquence. A native of Damascus, born of a Christian family in good position, he defended the veneration of images in controversy with the emperor Leo, and spent his later years as a monk at the monastery of S. Sabas, near Jerusalem. He was the author of an Encyclopedia of Christian Theology and of various treatises, but he is best known by his hymns, many of which are in use in English translations. He is the supposed author of the romance Barlaam and Josaphat (*q.v.*).

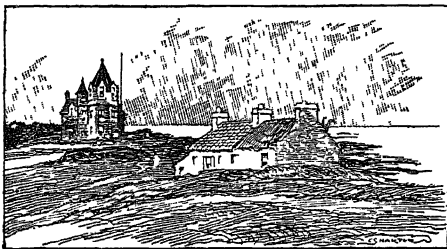
John of Gaunt. Popular name of the fourth son of Edward III of England, whose title was duke of Lancaster (*q.v.*). In Shakespeare's King Richard the Second, Gaunt delivers the famous speech about "this England." Gaunt = Ghent, where he was born.

John of Leyden or JOHANN BOCKHOLD (c. 1510–36). A Dutch Anabaptist. Born at Leyden, he worked for some years in London as a tailor, and later kept an inn at Leyden. Falling under the influence of the fanatic Matthyszoon, he went in 1534 to Münster, and by his preaching and fanatical personality became virtually the ruler of the city, and ultimately proclaimed himself supreme king. He

is said to have decreed and practised polygamy. After Münster surrendered to the Catholic armies, John was executed, Jan. 22, 1536. See Anabaptists.

John of the Cross (1542–91). Spanish saint and writer. Born at Toledo, the son of a silk weaver, his name was Juan de Yepes y Alvarez. On entering the Carmelite order in 1563, he took the name de la Cruz (of the Cross) and after studying at Salamanca was ordained priest in 1567. With S. Teresa he founded the Discalced, or reformed Carmelites. Opposed by the provincial of the order, he was imprisoned Dec., 1577, but escaped Aug., 1578. He died at Ubeda, and was canonised in 1726. His festival is Nov. 24. He wrote The Dark Night of the Soul and Spiritual Maxims. A study of S. John, by Father Gabriel, Eng. trans., appeared in 1946.

John o' Groat's House. Name of a spot on the N coast of Caithness, Scotland. It is about 2 m. W. of Duncansby Head and is regarded as the most northerly point of Great Britain. The name is due to



John o' Groat's House. Hotel and cottage near famous site on Caithness coast
From a sketch by C. G. Harper

a house erected here by a Dutchman named Groot or Groat about 1600. Other members of the family followed him to Scotland, and the story goes that, owing to disputes among them about precedence, John built an octagonal house with eight doors, in order that each of the eight Groots could enter by his own door. See Caithness.

John o' London. Pseudonym of Wilfred Whitten (1864–1942), who, during 1919–36, edited the weekly literary journal under that name. Whitten also edited T.P.'s Weekly, 1902–11, and wrote such books as London Stories, 1911; A Londoner's London, 1913. He died Dec. 19, 1942.

Johns Hopkins University. Institution at Baltimore, U.S.A., owing its existence to Johns Hopkins (1795–1873), a merchant, who gave £1,400,000 to establish a university and a hospital. It was

founded in 1876 as an institution, unique at that time in the U.S.A., for post-graduate study and research, with an equipment and faculty that should make it the equal of any European university. Under its first president, Daniel Gilman, it acquired great prestige. In 1946 it had nearly 3,000 students.

Johnson, Amy (1904–41). British airwoman. Born at Hull, of Danish descent, she graduated at Sheffield university, but, learning to fly at the London aeroplane club in 1928, adopted aviation as a career and was the first woman to gain a British ground engineer's licence. In May, 1930, she made the first solo flight by a woman from England to Australia, in 19½ days. She was created C.B.E. Further solo record flights followed: to Japan and back (1931); twice to the Cape and back (1932 and 1936). In 1932 she married James Mollison (*q.v.*), and with him made a number of distance flights, e.g. Pendine, Wales, to Bridgeport, U.S.A. During a race to Australia in 1934 they set up a record for England to Karachi. The marriage was dissolved in 1938. Amy Johnson joined Air Transport Auxiliary in the Second Great War, but was lost while flying an aircraft across the Thames estuary on Jan. 5, 1941. See Australian Flights.



Amy Johnson,
British airwoman

Johnson, Andrew (1808–75). President of the U.S.A. Born at Raleigh, N.C., Dec. 29, 1808, he was apprenticed to a tailor, and learned to read in his scanty leisure. In Greeneville, Tenn., where he worked at his trade in 1826, his abilities and fearless



Andrew Johnson

championship of the popular cause won him a place in local politics; he served the town as alderman and mayor, and in 1835 was sent to the state legislature. During 1843–53 he was a member of the house of representatives, and, after serving as governor of Tennessee for four years, returned to congress as a senator.

For a southerner Johnson took up a singular attitude on the

question of slavery. He did not denounce it, rather he disliked the agitation against it; but his first interest, like that of Lincoln, was to maintain the Union, and he was the only southern member of congress who voted against the secession. In 1864 he was chosen vice-president, and Lincoln's murder next year made him president.

In spite of previous utterances, Johnson followed the policy of clemency inaugurated by Lincoln. Government was restored in the southern states; a general amnesty was proclaimed; but soon a sharp divergence of opinion was seen to exist between the president and the Republican majority of congress, backed by some members of the cabinet. The majority would readmit the seceding states only on condition that they admitted negroes to the franchise, a policy distasteful to Johnson. A constitutional crisis was followed by impeachment of the president, on charges now generally regarded as trifling. The senate did not give a two-thirds vote against him and he was acquitted. Johnson left office in 1869, but was a member of the senate for a few months before his death, July 31, 1875. *Consult* Lives, J. S. Jones, 1902; L. P. Stryker, 1929.

Johnson, ESTHER (1681-1728). Friend of Dean Swift. Daughter of a merchant—or by repute a natural daughter of Sir William Temple—she was born at Richmond, Surrey, March 13, 1681, and during childhood lived at Moor Park, Temple's country seat. Here she met Swift, who, as Sir William's secretary, took part in her education. On Temple's death she received £100 and some lands in Ireland, whither she accompanied Swift in 1701. She is remembered by his *Journal to Stella*, the name by which he called her. She died Jan. 28, 1728, and was buried in S. Patrick's cathedral, Dublin. *Consult* The Basilisk of St. James's. E. Myers, 1945.

Johnson, HIRAM WARREN (1866-1945). American politician. Born at Sacramento, Sept. 2, 1866, he was educated at the university of California, and admitted to the bar in 1888. After a period in the legal office of his father, he settled in San Francisco and in 1906 made a name by securing the conviction of Abe Ruef for bribery. In 1911 he was appointed governor of California, and destroyed the enormous political power of the S. Pacific rly. in the state.

In 1912 Johnson followed T. Roosevelt in breaking from the

Republican party, but as the new party's candidate for the office of vice-president he shared Roosevelt's defeat. In 1917 he resigned his post as governor and was chosen a senator, and in 1919 came forward as a determined opponent of the League of Nations. He was a strong candidate for presidential nomination by the Republicans in 1920. In 1924 he opened a campaign for the presidential nomination by declaring himself an uncompromising isolationist. Yet he supported F. D. Roosevelt in the first years of the New Deal, only to oppose his proposals concerning the supreme court. In 1934 came the Johnson Act, which forbade the granting of loans to nations in default or arrears on their debts to the U.S.A. He was against reciprocal trade agreements, lend-lease, and the United Nations Charter. A senator for 28 years with scarcely a break, he died Aug. 6, 1945.

Johnson, JACK (1878-1946). An American negro boxer, born at Galveston. He became famous by knocking out Bob Fitzsimons in the second round at Philadelphia, July 17, 1907, and secured the world's heavyweight champion-

ship by beating Tommy Burns at Sydney, Dec. 26, 1908. He defended his title successfully against J. J. Jeffries, 1910, and held it until beaten after 26 rounds by Jesse Willard at Havana, April 5, 1915. He later served a long term of imprisonment for being associated with white slave traffic. He died as the result of a car accident at Raleigh, N.C., June 10, 1946.

Johnson, LIONEL PIGOT (1867-1902). British poet and critic. He was born at Broadstairs, March 15, 1867, and educated at Winchester and New College, Oxford. On coming down he wrote reviews for the Pall Mall Gazette and other papers. In 1891 he became an R.C. and in 1893 visited Ireland, events which influenced his development as a poet. Though his first collected volume appeared in 1895, he had written earlier several well-known pieces, like the lines *By the Statue of King Charles*. Yeats said Johnson "loved his learning better than mankind." His poetry is the expression of a troubled soul; it is strong and sombre, less often deep. After much ill-health he died Oct. 4, 1902, from a fall in Fleet Street.

SAMUEL JOHNSON, LL.D.

Roger Ingpen distinguished Johnsonian editor and scholar

The information given in this biography is supplemented by the articles Biography; English Language and Literature. See the articles on Boswell, Goldsmith, and other contemporaries

Samuel Johnson was born at Lichfield, Sept. 18, 1709, the son of a bookseller. When a child he was "touched" by Queen Anne for

Elizabeth Porter, a widow twenty years his senior.

Having attempted without success to keep a school at Edial, near Lichfield, his only known pupils being David Garrick and two others, he abandoned the calling of schoolmaster, and came to London with Garrick in 1737 to pick up a living by his pen. He performed some task work on *The Gentleman's Magazine*, such as reporting parliamentary speeches, and in 1744 wrote a vigorous *Life of Savage*, in which he attempted to vindicate the poet's character.

He also turned to poetry, produced two satires which extended his reputation—*London*, 1738, and *The Vanity of Human Wishes*, 1749—and obtained the production, through the interest of Garrick, of his tragedy, *Irene*, at Drury Lane. In 1747 he published his *Plan*, addressed to Lord Chesterfield, for the Dictionary associated with his name. Chesterfield withheld his patronage, but the Dictionary, supported by the booksellers, proceeded, and was published in 1755. For this great work, which undoubtedly helped



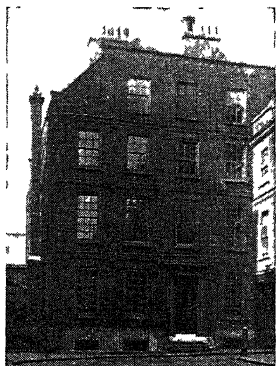
Sam. Johnson

After Sir J. Reynolds

the king's evil, and, having attended a school at his native town, he proceeded in 1728 to Pembroke College, Oxford, leaving there without taking his degree. At twenty-six he made a love match with

to consolidate the English language by fixing the meaning of words as we now use them, he received the not too liberal sum of £1,575. Johnson's noble letter to Chesterfield, spurning his tardy expression of interest in the Dictionary, has been described as "the literary man's Magna Carta."

In 1750 he began to write *The Rambler*, a semi-weekly series of rather heavy essays and tales, somewhat on the lines of *The Spectator*, and eight years later issued a second series in a lighter vein, entitled *The Idler*. On the death of his aged mother in 1759, in order to defray her funeral



Dr. Johnson's house in Gough Square, London, where he produced his Dictionary

expenses, Johnson wrote the philosophical romance *Rasselas* in a week, for £100. Notwithstanding his activities, he was always in straitened circumstances; he was twice arrested for debt, but released through the kind offices of Richardson, the novelist. In 1762, owing to the efforts of influential admirers, he received through Lord Bute a government pension of £300 a year for his services to literature, and henceforward was able to live in comfort. A year later he met James Boswell (*q.v.*), who immediately conceived the happy idea of writing Johnson's life. It is due to Boswell's assiduity and genius that we know more about Dr. Johnson perhaps than any other Englishman.

In 1764 Johnson founded the famous Club, the last of many he had called together, of which Reynolds, Burke, Goldsmith, and others of his contemporaries and friends were members. A year later began his acquaintance with Henry Thrale, a prosperous brewer, and his vivacious wife, at whose hospitable home at Streatham he was always a welcome visitor. The friendship of Mrs. Thrale became an essential part of the doctor's existence, and was terminated only towards the end of his life by her second marriage to Gabriele Piozzi. Johnson's long-promised edition of Shakespeare appeared in 1765. In 1773 he visited the Hebrides in company with Boswell, both publishing accounts of the tour. The degree of LL.D. was conferred upon him by Dublin in 1765 and a similar

honour by Oxford in 1775. Johnson's last work, and in some respects the most readable of his books, *Lives of the Poets*, appeared in 1781. Morbid by nature, he had a great fear of death, but met his

end, as he did all adverse fortune, with courage on Dec. 13, 1784. He was buried in Westminster Abbey. His house, 17, Gough Square, off Fleet Street, was bought by Cecil Harmsworth, restored, and opened to the public in 1914. (See Johnson Society.)

In James Boswell's inimitable *Life* (constant reissues) are described with genius the varied characteristics of this great personality: his rugged appearance, vigorous talk and ready wit, simple piety and benevolence, uncouth manners, kindness of heart, wide and thorough scholarship. Few men can have had friends of so high an intellectual calibre, yet they listened to him as to an oracle and a sage. Johnsonian literature is vast. An Oxford edition of his works ran to 9 vols., 1825. Macaulay wrote a classic essay for the *Encyclopedia Britannica*. Johnson's letters were edited by G. B. Hill, 1887; his letters to Mrs. Thrale by the Marquess of Lansdowne, 1934. There are *Lives* by L. Stephen, 1902; H. Kingsmill, 1934; consult also *Ursa Major*, C. E. Vulliamy, 1946.

Johnson, Sir William (1715-74). British soldier. Born at Smithtown, co. Meath, where his father was a landowner, he went in 1738 to America, and was put in charge of a settlement on the Mohawk river. He made the acquaintance of the Mohawk Indians, and it is on his dealings with them that his fame mainly rests. They appear to have thoroughly trusted Johnson, who understood them better than any other Englishman of his time.

He led the expedition sent in 1755 against Crown Point, and was responsible for the victory on the

shores of Lake George and for the capture of Fort Niagara in 1759. He showed skill in negotiations with the Indians, dissuading powerful tribes from joining the French. Johnson's rewards included a baronetcy and a large tract of land on the Mohawk; there he built Johnson Hall, round which the city of Johnstown, N.Y., has grown up, and there he died, July 11, 1774. Consult Johnson of the Mohawks, A. Pound, 1930.

Johnson, William Eugene (1862-1945). An American temperance advocate, nicknamed Pussy-foot. Born at Coventry, N.Y., March 25, 1862, he became a real estate dealer. In 1889 he founded the Red Ribbon temperance reform club. He studied the drink problem in Sweden and England, and in 1906 became special officer for the suppression of the liquor traffic in Indian territory. With the advent of prohibition in the U.S.A., he began a temperance campaign in England, and in Nov., 1919, lost an eye when one of his London meetings was broken up by medical students; but he continued his crusade until his return to America in April, 1920. Despite the repeal of the 18th Amendment in 1933, he continued to preach prohibition until his death on Feb. 2, 1945.

Johnson Society of London. Founded in 1928 at the instigation of the Rev. W. Pennington-Bickford, rector of St. Clement Danes, the church at which Samuel Johnson used to worship. Its objects are to study the life and perpetuate the memory of this great Englishman. G. K. Chesterton was the first president, meetings being held monthly at 17, Gough Square, where Johnson compiled his Dictionary. Owing to damage in an air raid of the Second Great War, a temporary home was found in the parish room of St. Mary-le-Strand. A journal, *The New Rambler*, is published twice yearly.

Johnson, Albert Sidney (1803-62). American soldier. Born at Washington, Ky., Feb. 3, 1803, he was educated at West Point. Resigning from the army in 1834, he went to Texas and became commander of the Texan army in its struggle for independence. During the war between Mexico and the U.S.A. he commanded a body of Texan volunteers, and conducted an expedition against the Mormons in 1858. On the outbreak of the Civil War he joined the Confederates and was appointed to the command of the forces in the West. His death at



Sir William Johnson, British soldier

the victory of Shiloh Church, April 6, 1862, was a loss to the Confederate cause.

Johnston, ALEXANDER KEITH (1804-71). Scottish cartographer. Born in Edinburgh, Dec. 28, 1804, he was educated at the university and in 1843 published his *National Atlas*. He was thereupon appointed Geographer Royal to Scotland, and in 1848 brought out the *Physical Atlas of Natural Phenomena* which made his name. The *Dictionary of Geography*, produced in 1850, was reissued in 1877 as Johnston's *Gazetteer*. The *Royal Atlas of Geography*, 1861, is a good example of cartography. He died July 9, 1871.

Johnston, DENIS. Irish playwright, noticed under his full names, William Denis Johnston.

Johnston, SIR HARRY HAMILTON (1858-1927). British explorer and administrator. Born in London, June 12, 1858, he was educated at Stockwell grammar school and King's College, London, and then studied at the Royal Academy of Arts. After travelling in N. Africa, 1878-80, he explored Angola and the Congo, 1882-83. Having led a scientific expedition to Mt. Kilimanjaro, he was appointed H.M. vice-consul to Cameroons, 1885, acting consul in the Niger Coast protectorate in 1887, and consul for Mozambique in 1888. In 1889 he explored Lakes Nyasa and Tanganyika and founded the British Central Africa protectorate, of which he was commissioner in 1891. Knighted in 1896, he was appointed consul-general for the regency of Tunis, 1897-99; and thence until 1901 was commander-in-chief and consul-general for Uganda. Sir Harry wrote largely on tropical Africa and its natives. He discovered the okapi in 1900. He published an autobiography in 1923, and died July 31, 1927.

Johnston, JOSEPH EGGLESTON (1807-91). American soldier. Born near Farmville, Va., Feb. 3, 1807, he graduated at West Point. He served with distinction in the Mexican War. In 1860 he was made quarter-master-general but on the outbreak of the Civil War he resigned out of loyalty to his state, and in 1861 became major-general of the army of Virginia, fighting first in the Shenandoah against Patterson. During and after the first battle of Bull Run he was c.-in-c. of the army of Virginia.

In opposing McClellan's attack on Richmond, in the battle of Fair Oaks, May 31, 1862, he was severely wounded and handed over the command to Lee. Parti-

ally recovered, in May 1863 he was given the command of the Confederate forces in Mississippi to try to effect the relief of Vicksburg, but his forces were inadequate. During the summer of 1864, still with insufficient forces, he tried to stay Sherman's advance in Tennessee; failing to do this he was superseded by Hood. Lee, who recognized the soundness of Johnston's judgement, procured his reinstatement, but by this time the Confederate cause was lost, and after Lee's surrender he made terms with Sherman. In 1874 he published *Narrative of Military Operations during the Late War*. He died at Washington, D.C., March 21, 1891.

Johnston, MARY (1870-1936). American novelist. Born Nov. 21, 1870, at Buchanan, Va., she made her first success with *Prisoners of Hope* (also known as *The Old Dominion*) in 1898. She brought out at least one book annually from 1911 till 1935. But her most widely read novels were the earliest, in which she depicted life in the Southern states just before and after the Civil War, especially *By Order of the Company*, 1900. Died at Warm Springs, May 9, 1936.

Johnston, (WILLIAM) DENIS (b. 1901). Irish dramatist. Born in Dublin, June 18, 1901, he was educated at S. Andrew's college there; Merchiston; Christ's, Cambridge; and Harvard. A barrister, he was appointed director of the Dublin Gate Theatre in 1931. In 1936 he joined the B.B.C., being war correspondent 1942-45, and television programme director 1946-47. He made his name with *The Moon in the Yellow River*, a deliciously irrational comedy, produced at the Abbey Theatre, Dublin, 1931, and the Westminster Theatre, 1934. His other plays include *The Old Lady Says No*, 1929; *A Bride for the Unicorn*, 1933; *Weep for the Cyclops*, 1940.

Johnstone. Town and police burgh of Renfrewshire, Scotland. It stands on the Black Cart, 10 m. W. of Glasgow, and has a railway station. Engineering works, cotton mills, flax mills, paper mills and foundries exist



J. E. Johnston,
American soldier

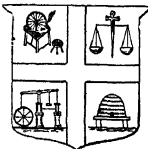
here. The water supply is controlled by Paisley. Near is Elderslie, said to be the birthplace of Sir William Wallace. The place was only a hamlet before the cotton manufacture started about 1780. Made a burgh in 1857, it is in the co. constituency of W. Renfrewshire. Pop. 13,620.

Johnstone, JAMES (1719-80). Scottish Jacobite, known as the chevalier de Johnstone. Born in Edinburgh, son of a merchant, he joined Prince Charles Edward in 1745, served throughout the Jacobite campaign, and escaped after Culloden to Holland. Afterwards he lived in Paris, and then served with the French forces in North America, being at the defence of Louisbourg and at Montreal. His later years were passed in France. Johnstone wrote in French an account of his adventures. Part of this was published in English in 1820 as *History of the Rebellion of 1745-46*, and the whole in 1870.

Johnston Island. American territory in the North Pacific. Located 600 m. S.W. of Hawaii, it consists of two islets on an 8 m. reef. It was discovered by a British warship in 1807, being named after the captain. American possession was established in 1929 when it became a bird sanctuary. Later a seaplane base was set up, which was not attacked when the Japanese bombed Pearl Harbour.

Johnstown. City of New York, U.S.A., the co. seat of Fulton co. On Cayadutta Creek, it is 49 m. N.W. of Albany in the vicinity of the Adirondack state park. Served by rly. and an airport, it is the leading leather-glove manufacturing centre in the country, with factories and tanneries, and also produces machine shop products and gelatine. Johnson Hall, a Georgian mansion built in 1762 by Sir William Johnson, who introduced glove-making, and brought over a colony of Scots, is maintained as a state museum. The court house, built 1772, is said to be the oldest in the U.S.A. Pop. 10,666.

Johnstown. City of Pennsylvania, U.S.A., in Cambria co. At the union of the Little Conemaugh river and Stony Creek, it is 76 m. E.S.E. of Pittsburgh and is served by the Baltimore and Ohio and the Pennsylvania rlys. and an airport. One of the state's centres of iron ore, bituminous coal, and steel, besides iron and steel it produces mining equipment, electrical goods, motor vehicles, paints, soap, bricks, cement, furniture, silk, textiles, and cigars. In the vicinity are the Gallitzin state



Johnstone arms

forest and the Quemahoning reservoir. A disastrous flood occurred here, May 31, 1889, when a dam collapsed on the South Fork, an affluent of the Little Conemaugh river; 2,200 lives were lost and damage to property was estimated at more than \$2,500,000. After a flood in 1936, army engineers deepened channels and erected levees and dams. Pop. 66,688.

Johore. Sultanate in the Malay peninsula and state of the Malayan Federation (*q.v.*). Formerly one of the five unfederated Malay states, it came by treaty of Dec. 11, 1885, under British protection, the sultan agreeing to accept a British general adviser. There are an executive council and a legislative council of official and unofficial members. Lying at the extreme South of the peninsula, Johore covers 7,330 sq. m. and has an est. pop. of 737,590. The predominant religion is Islam. The interior is mainly jungle, and the state is less mountainous than other parts of Malaya. Rubber is the principal product and export. The rly. from Penang to Singapore traverses the state for 121 m., and a causeway across the Straits of Johore connects it with Singapore. Johore was the scene of bitter fighting in Jan. and Feb., 1942, during the Japanese advance on Singapore. It remained in Japanese occupation until the surrender in Malaya, Sept. 4, 1945. On July 31, 1945, the British midget submarine XE3 carried out a daring attack on the Japanese cruiser Takao in the Straits. Johore joined the Malayan Federation on Dec. 23, 1946.

Joinder (Lat. *jungere*, to join). English law term used in three main senses. (1) Of issue. When the pleadings are closed the parties are said to join issue, *i.e.* they have arrived at an issue or point on which they differ, but which they agree is the point to be decided. (2) Causes of action. A plaintiff is allowed to join in one writ or one statement of claim several causes of action. Thus he can in the same action claim money due as a debt and damages for libel or trespass. This is always subject to a discretion in the court to order the several matters to be tried separately, where it would be embarrassing or inconvenient to try them together. For instance, if A had a claim against B for an injunction to restrain infringement of a patent, and also a claim for damages for slander, the court would probably order them to be tried separately. (3) Of parties.

All persons can sue or be sued in the same action by or against whom relief is claimed jointly or severally or in the alternative; provided that the action by or against them all arises out of the same facts and circumstances.

Joiners' Company. A London city livery company. Existing as a guild early in the 14th century, it was incorporated by letters patent in 1571, and was an offshoot from the Carpenters'. Joiners' Hall Buildings, in Upper Thames St., London, E.C., are on the site of the hall, which was let as a warehouse in 1857. The offices of the company are at 12, Devonshire Sq., E.C.2.



Joiners' Company arms

Joinery. A class of woodwork lighter than carpentry and concerned with making door and window frames, doors, cupboards, staircases, panelling, gates, partitions. Fixing all these and also the many trimmings and linings used inside buildings is the work of the joiner, who makes by hand a proportion of the articles. Most joinery, however, is made by machinery today.

A large part of the work is the proper and accurate jointing of wood members so that they are strong and the parts of the timber most prone to shrinkage and swelling are protected. Many building woodworkers combine the crafts of carpenter and joiner. See Cabinet Making; Carpentry.

Joint. In anatomy, articulation between two bones. The following forms of joints are recognized: *Synarthroses*, or immovable joints, such as those between the component bones of the skull; *amphiarthroses*, which allow slight movement between the bones, *e.g.* the inferior tibio-fibula joint; and *diarthroses*, freely movable joints.

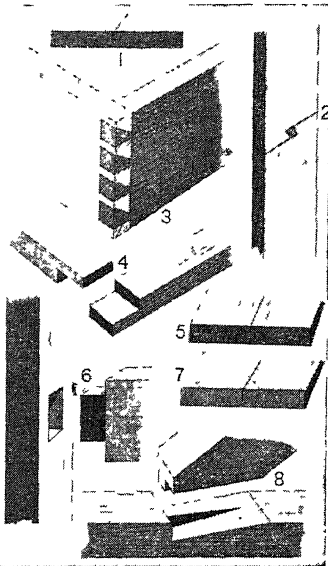
Diarthroses are subdivided into *ginglymus* or hinged joint, which admits only of movements of flexion and extension, such as that of the ankle; *condyloid joint*, in which the articular surfaces are spheroidal and allow of all varieties of angular movements, such as those between the metacarpus, or flat of the hand, and fingers; *saddle joint*, in which the movements are similar to those in the condyloid joint, but the articular surfaces are reciprocally saddle-shaped, such as the carpo-metacarpal joint of the thumb; *ball-and-socket joint*, in which the

articular surfaces are approximately spherical and free movement in any direction is allowed, such as the shoulder and hip joint; *trochoid on pivot joint*, in which rotation only is allowed, as in the radio-ulnar joint; and *arthrodia* or *gliding joint*, in which the articular processes are nearly flat and allow only gliding movements, as in the joints between the articular processes of the vertebrae.

The ends of the bones forming a movable joint are covered with an articular cartilage, providing smooth surfaces between which movements take place, and also serving to some extent as a buffer in reducing the effect of sudden jars on the joint. Enveloping the joint is a fibrous sheath, the capsular ligament, the bones being further held in their places by strong ligaments passing from one to another, and by the tendons of the muscles. The capsule is lined internally by a smooth membrane, the synovial membrane, from which is exuded a fluid which acts as a lubricant to the joint. In parts of the joints where there is much friction, small sacs called bursae are developed. These contain fluid, and serve to reduce the effect of friction. The joints have also blood-vessels and nerves. See Anatomy; Hip-joint; Man.

Joint. In geology, a crack or plane of fracture which cuts across rocks, and along which there has been little or no movement. Joints occur in both sedimentary and igneous rocks. In the former they often lie at approximately right angles to the bedding. Two or more well-developed intersecting sets are termed a joint system. Systems at approximately 90° cause rocks to break into rectangular masses and so are of great assistance in the quarrying of building stones. Joints may result from shrinkage on the drying out of sediments, or shrinkage on the cooling of igneous rocks. Some lavas develop systems at 120° in this way, with the formation of six-sided columns, as at the Giant's Causeway, and on Staffa. Many joints are related to earth movements; they may be shown as resulting from tensional or shearing stresses in the rocks. Joints provide passages for accumulation or circulation of underground water, as in the chalk below London. In soluble rock such as limestone, joints may become enlarged and extensive caverns formed.

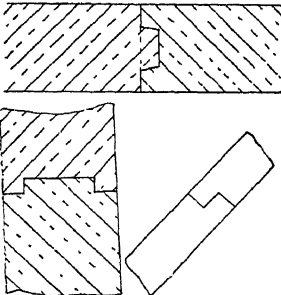
Joint. Device for holding together two or more members of a structure. In carpentry the chief



Joint. In carpentry: 1, rebated; 2, scarfed; 3, dovetail; 4, halving; 5, tongued and grooved; 6, mortise-and-tenon; 7, plain; 8, bridal joints

joints are those employed (1) to form a bearing for one member resting upon another, as in roof or floor; (2) for lengthening members, as in the fished joint or scarfed joint for shoring and for roof purlins; (3) at angles, by means of a mortise-and-tenon, as at the junction of a post to a sill or plate, or the tusk tenon at the connexion of a trimmer joist in a floor; (4) to increase the width of members—mainly in joinery, of which an example is the tongued and grooved longitudinal joint.

The primary considerations in carpentry joints are structural strength and adequate stiffness. In joinery some of the same types are modified to suit the lighter nature of the materials and structures. Mortise-and-tenon joints of many types are employed.



Joint. In masonry: left, table joint for resisting thrust; right, rebated joint for gable and ramp coping; top, mortise-and-tenon joint or landing joggle

Bolted joints suit heavy timber work. The term "jointed" in woodwork implies that members are connected by one of the forms of accurately cut and fitted joint mentioned.

In masonry, apart from joints in which the members are worked true and merely butted together, there are joggled joints, in which a sort of tenon on one member enters a recess in another stone; rebated joints; and the table joint, again with a kind of large tenon, to prevent one member sliding upon another under lateral pressure.

In steel and wrought iron members of a structural nature, the joints of plates may be overlapped and welded, or have their ends butted, with cover-plates at either side, and be riveted through or bolted. Beams are connected to one another or to pillars by riveting or bolting in heavy work or by welding in lighter construction; plates are riveted or bolted to the web or flange in order to connect two members end-to-end for lengthening purposes. For roof trusses and similar light frames there is the pin joint; the ends of the members are formed with eyes, the eyes of the joint members are lined up, and a steel pin is put through and secured with a cotter.

Joint Advisory Council. National body representative of the British Employers' Confederation and the Trades Union Congress, established in 1939 as a means of consultation between government departments and organized employers and workpeople on "all matters in which employers and workers have a common interest." It was formed primarily to increase the total effectiveness of the country's war effort, but was continued after the war as the National Production Advisory Council. This consists of members appointed by the president of the board of trade from nominations of the British Employers' Confederation, the F.B.I., and the T.U.C. The N.P.A.C. operates through its emergency committee and regional boards for industry.

Joint Industrial Council. A British organization representing employers and workpeople, and

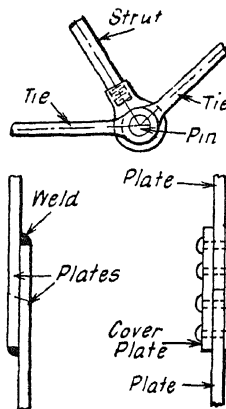
having as its object "the regular consideration of all matters affecting the progress and well-being of the trade from the point of view of all those engaged in it . . . and the general interest of the community." The establishment of such councils was one recommendation of the Whitley committee set up in 1916. In the administrative and legal departments of the civil service the councils are known as Whitley councils. J.I.C.s vary greatly in authority, in structure, and in the extent of their activities; but they include for each industry representatives of employers' associations and of trade unions, with a chairman who may

be chosen from outside the industry, one or more secretaries, and a treasurer, together with members coopted for their special knowledge of the industry. National J.I.C.s work largely through committees and district councils.

Joint Stock. The system by which an association of individuals, possessing a common capital, is incorporated into a whole, thereby possessing rights and responsibilities apart from those of the individuals forming it. Usually such an association is within the provisions of the Joint Stock Companies Act, 1844, or acts amending and consolidating joint stock company legislation. Thus it differs from an incorporation under royal charter, such as the East India Company, or from statutory companies each of which is created and governed by separate act of parliament. By far the largest number of companies now operating in the U.K. are joint stock companies, having a capital divided into either shares or units of stock. See Company Law.

Joint Tenancy. English legal term. It means the conveyance of real or personal property to two persons as one property—not divided into shares—with a right in the survivor to take the whole. Thus, a gift of land to A and B and their heirs makes A and B joint tenants; and the survivor will take the whole estate.

Jointure. Legal term signifying strictly a joint estate limited to both husband and wife; but in



Joint. In metal: left, welded lap joint; right, double-cover riveted butt joint; top, pin joint showing strut and ties

common acceptance an estate for life which is to take effect instantly when the husband dies.

Joinville. A town of Brazil. In Santa Catharina state, it is about 85 m. N. of Florianopolis. It is the capital of the colony of Dona Francisca, which was founded in 1851 by a group of emigrants from Germany. It is reached by rly. from S. Francisco do Sul. There are breweries, distilleries, and agricultural interests. Pop. 46,000.

Joinville. Town of France. It stands on the Marne, in the dept. of Haute-Marne, 27 m. N. of Chaumont by rly. The town gave its name to the powerful family of the great French chronicler, to whom it has a statue. Their burial place, the chapel of S. Anne, still stands. There is another Joinville, in the Seine dept.; pop. 13,612.

Joinville, François, Prince of (1818-1900). French sailor. Born at Neuilly, Aug. 14, 1818, third son of Louis Philippe, king of the French, he entered the navy in 1836, and saw much active service at Vera Cruz, on the Moroccan coast and elsewhere. The events of 1848



Prince de Joinville,
French sailor

drove him into retirement, although his public writings and speeches had made him popular. From 1848 he was a refugee in England, mainly at Claremont, Surrey. The prince went to America in 1861, being anxious to serve in the Civil War. In 1870 he entered France, under disguise, and fought thus in the later stages of the Franco-Prussian War. Two departments elected him to the national assembly of 1871, and he sat in the chamber until 1876. He died in Paris, June 16, 1900. The prince wrote books on naval and military matters. His wife was a daughter of Pedro I, emperor of Brazil, and his only son was known as the duke of Penthièvre.

Joinville, Jean de (1224-1319). French historian. A member of one of the noblest families in Champagne, he became a courtier and a soldier. Becoming head of his family, sire de Joinville, he was also seneschal of Champagne, and his time was passed between Paris and the province. He went on crusade with S. Louis, in the expedition of 1248-54, but declined to take part in the one which ended the king's career. About 1281 he began to write his History of

S. Louis, which he finished in 1309. He died July 11, 1319, aged 95.

Joinville is one of the three great chroniclers of medieval France. His hero is S. Louis, and it is to Joinville that we owe much of our knowledge of that king. He gives a full account of the unfortunate expedition to Egypt. The book is written in Old French; there are modern editions, notably that of F. Michel, 1859; English translations by J. Hutton, 1868; E. Wedgwood, 1906; F. T. Marzials, 1908. Joinville also wrote a Credo.

Joist (O.F. giste, bed). Beam or girder of wood, or metal supported at both ends or at intervals, carrying a load between its points of support. See Building; Girder.

Jokai, Mór or Maurice (1825-1904). Hungarian novelist. Born at Komorn, Feb. 19, 1825, and educated at Pressburg (Bratislava) and Papa, Jokai afterwards settled down at Budapest as author, editor, and politician. He produced novels, romances, histories, dramas, poems, and essays. He edited the political daily Hon (1863), the humorous weekly Ustökös (1858-1881), and Nemzet (1894), and sat in the lower house of the Hungarian parliament from 1861 to 1897 when he was called to the house of magnates. He died at Budapest, on May 5, 1904.

Working Days was the book that made his name in 1845. Twenty-five stories were translated into English. The best known are *The Turks in Hungary*, 1852; *The New Landlord*, 1868; *The Modern Midas*, 1886; *Eyes Like the Sea*, 1893; *Black Diamonds*, 1896; *The Lion of Janina*, 1897.

Jokjakarta. Town and former native state of Java. The former state is a lowland strip 1,200 sq. m. in area, fronting the Sunda Sea on the S. coast of the island. The annual rainfall exceeds 80 ins. Sugar is the chief crop. Until the creation of the republic of Indonesia, a native prince, assisted by a gov. appointed by the Netherlands, ruled Jokjakarta state. The town, the fifth largest in Java, with a pop. of 97,000, was chosen as the capital of the republic of Indonesia in 1946. It is connected by rly. with the chief places in the island, and has an airfield and a radio

station. There are variant spellings of the anglicised form of the name.

Joliet. City of Illinois, U.S.A., the co. seat of Will co. On the Des Plaines river, which here is incorporated in the Illinois Waterway joining Lake Michigan with the Mississippi, it is served by rlys. Lying 38 m. S.W. of Chicago, amid farm land and near limestone quarries, Joliet makes chiefly wallpaper, and has rly. shops, oil refineries, boilerworks, and manufactures of furniture and roofing materials. The Stateville prison is the largest in Illinois. Pop. 42,365.

Joliette. Town and county of Quebec, Canada. The town stands on the Assomption, a lumbering stream, 36 m. N.N.E. of Montreal, and is served by the C.N.R. and C.P.R. It is a centre for lumbering and quarrying. Pop. 12,678. The county has a river frontage of less than 20 m., and extends to the N.W. for 200 m.

Joliot, Frédéric (b. 1900). A French physicist. Born March 19, 1900, he studied at the Lycée Lakanal and the Paris school of physics and chemistry. He then became assistant to Mme. Curie, and in 1926 married her daughter Irène, with whom he continued the Curies' work on radio-activity. In 1933, while at the Radium Institute, Joliot and his wife bombarded aluminium with alpha particles and obtained a nuclear transformation in which an isotope of phosphorus was created with an emission of neutrons. For this work induced radio-activity they were jointly awarded the Nobel prize for physics, 1935. See Curie.

Jolly-boat (Dan. *jolle*, yawl, confused with the English adj. jolly). The name given to a general utility boat carried by large vessels. It can be either rowed or sailed, collapsible rigging being provided. See Boat; Cutter.

Jolly Roger. Pirate flag. Traditionally connected with the pirates of the Spanish Main, who adopted it as their ensign, it was a black flag ornamented with a skull and crossbones. It was sometimes flown by British submarines



on returning from a mission to denote the sinking of enemy shipping during the Second Great War.

Jolson, Al (b. 1886). American actor and singer. Born Asa Yoelson



Jokai
(Maurice Jokai)

coast of Scotland and down the eastern side, and came into action with two British ships off Scarborough, Sept. 23, 1779. The Bonhomme Richard and the British Serapis both sank, not, however, before the latter had struck her flag to Jones. He made Texel with the remainder of his fleet, but the Dutch refused to recognize the American flag. Jones accordingly sailed to France, whence he returned to America in 1781. Having travelled for some years, he was appointed an admiral in the Russian navy (1788), but returned in 1790 to Paris. Died July 18, 1792. *Consult* Life, A. C. Buell, 1906; The Sailor Whom England Feared, R. M. Crawford, 1913.

This is the man after whom is named a popular ballroom dance in which partners and tempi are changed at frequent intervals, sometimes to the appropriate refrain of *A Life on the Ocean Wave*.

Jones, KENNEDY (1865-1921). British journalist. Born in Glasgow, May 4, 1865 and educated at the high school he served on journals in Glasgow, Birmingham, and London before he became in 1894 editor of the *Evening News* when it passed into the control of Harnsworth Brothers. He was also associated with the founding of the *Daily Mail* and the *Daily Mirror*. In 1916 he became M.P. for Hornsey, and in 1917 was director-general of the food economy department. In 1920 he published a work of reminiscences and criticism, *Fleet Street and Downing Street*. He died Oct. 20, 1921.

Jones, PARRY (b. 1891). British tenor singer. He was born at Blaina, Mon, Feb. 14, 1891, and received his musical education in S. Wales, at the R.C.M., and in Italy and Germany. In 1915 he was among the survivors when the *Lusitania* was torpedoed. Principal tenor with the D'Oyly Carte, Carl Rosa, Beecham, and British National opera companies, he appeared at 12 international seasons at Covent Garden, also travelling in Europe and America. He sang at the dedication of the Unknown Warrior's tomb in Westminster Abbey; was principal tenor at the Beethoven and Schubert centenary festivals in London; and appeared at promenade concerts, especially in Wagner and in Beethoven's ninth symphony.

Jones, RICHARD (1790-1855). British economist. Born at Tunbridge Wells, he graduated at Caius College, Cambridge, and became a clergyman, but in 1833 forsook this calling and was made

professor of political economy at King's College, London. During 1835-55 he taught the same subject at the East

India College, Haileybury. His essay on the Distribution of Sources of Taxation marks a break from the system upon which Ricardo elaborated his whole economic theory. Instead of deducing his conclusions from first principles, Jones founded them on observation of contemporary facts and on the study of history. He was thus led to question the validity of some conclusions drawn from Ricardo's theory of rent, and he refuted Malthus's theory concerning the danger of over-population by claiming that in a well-governed state command over food supplies increases, by means of imports if necessary, at least as fast as the population. He died Jan. 26, 1855. *See* Malthusianism.

Jones, SIR ROBERT (1858-1933). A Welsh surgeon. Born at Rhyl, June 26, 1858, he studied medicine in Liverpool, and became known for orthopaedic practice. His work during the First Great War gave him a world-wide reputation, based as it was on cooperation with manipulative surgeons. The inventor of classic methods of procedure for almost every operation coming within his range, he was knighted in 1919 and made a baronet in 1926. The founder in 1920 of the British Orthopaedic Association, and a great teacher, he was ranked by some with Lister and Manson in the value of his work for humanity. Jones died Jan. 14, 1933. *A Life* by F. Watson appeared in 1934.

Jones, ROBERT TYRE (b. 1902). American golfer, known as Bobby Jones. Born at Atlanta, March 17, 1902, he was educated there and at Harvard and became a lawyer. He won the American amateur golf championship in 1924-25-27-28-30 and the open championship in 1923-26-29-30. Visiting Great Britain, he became open champion in 1926-27-30 and amateur champion in 1930, thus performing that year the unparalleled feat of winning these four titles, upon which he retired from first-class golf. Jones first represented his country in Walker Cup matches in 1921. His swing and style were classic, and he was always one of the most popular figures in the game. In



Richard Jones,
British economist
After Eddis

1927 he wrote *Down the Fairway*, an autobiography.

Jones, SIDNEY (1869-1946). British composer. Born at Leeds, he was educated there, and in 1892 became famous as the composer of the song *Linger Longer Loo*. His musical comedies, *A Gaiety Girl*, and *An Artist's Model*, were performed in 1893 and 1895. His greatest success was *The Geisha* (q.v.), 1896. Other shows with Jones's music included *San Toy*, 1899; *The King of Cadonia*, 1908. *The Girl from Utah*, 1913, and in *The Happy Day*, 1916, he collaborated with Paul Rubens. He died Jan. 29, 1946.

Jones, SIR WILLIAM (1746-94). British Oriental scholar. Born in London, Sept. 28, 1746, and edu-

cated at Harrow, he graduated at University College, Oxford. He had already become proficient in Arabic, Persian, and Hebrew and several European languages. His French translation of the life of



Nadir Shah, 1770, was followed in 1771 by his *Grammar of the Persian Language*. In 1772 he became F.R.S., while his membership of Johnson's literary club, 1773, brought him the acquaintance of the principal literary men. Called to the bar in 1774, two years later he became a bankruptcy commissioner. Of his legal writings, the *Essay of Bailments*, 1781, is best known. Appointed judge of the high court of Calcutta and knighted in 1783, he proceeded to India, where he founded the Asiatic Society of Bengal. He was the first Englishman to learn Sanskrit, the affinity of which to Latin and Greek he immediately appreciated, a discovery of the utmost importance in philology. He issued translations of Vedic literature, and was planning a monumental work on Mahomedan and Hindu law when he died at Calcutta, April 27, 1794.

Jongkind, JOHANN BARTHOLO (1819-91). Dutch painter. Born at Latrop, Holland, June 3, 1819, he studied under Isabey at Paris, and made his debut as a landscape painter at the Salon in 1845. His work was frequently rejected and a third-class medal in 1852 was the only recognition of his merit. His etchings were better appreciated. They are really slight but vivid

W. Jones
After Reynolds

expressions of his vision, and he had the courage to print these abbreviations before Whistler had attempted his second and even more daringly slight manner. Dordrecht and other Dutch and Flemish towns supplied Jongkind with subjects. After 1872 he lived in retirement until his death, Feb. 9, 1891.

Jongleur (old Fr. *jongleur*; Lat. *joculator*, jester). Medieval musician. Primarily attendants on the troubadours, they came to occupy an important position by themselves. They combined the roles of instrumental musicians and singers with those of jugglers and jesters, and early formed companies of entertainers who afforded light relief to the more serious art of the troubadours to whose retinue they belonged. Jugglers at modern fairs are direct descendants of the medieval jongleurs. See Troubadour; consult English Wayfaring Life in the Middle Ages, J. J. Jusserand, new ed. 1891; The Troubadours and Courts of Love, J. F. Rowbotham, 1895.

Jönköping. Län or govt. of S. Sweden. It extends S. of Lake Vätter and includes most of the highlands of S. Sweden, and forms part of the fertile Gothland. Area, 4,449 sq. m. Pop. 253,591.

Jönköping. Town of Sweden, the capital of the län or govt. of Jönköping. At the S. end of Lake Vätter, 115 m. by rly. E. of Gothenburg, it has a spacious harbour, and manufactures matches (the chief industry), wood pulp, paper, carpets, arms, machinery, and textiles. Iron and sulphur are obtained in the locality. Among the chief buildings are a 17th century appeal court and a town hall. A peace treaty was signed here between Denmark and Sweden in 1809. Jönköping became a town in 1284. Pop. 39,955.

Jonquil (*Narcissus jonquilla*). Bulbous perennial herb of the family Amaryllidaceae, indigenous to Spain, whence it was introduced to



Jonquil. Flower-head and leaves

British gardens about 1596. From the egg-shaped bulb arise several narrow half-rounded leaves from 8 ins. to 12 ins. long, and one or two tall flowering stems ending in a spathe. From this

emerge later from 2 to 6 separately stalked fragrant flowers about 1½ ins. across, with a tube almost as long. They are bright yellow with six petal-like divisions and a saucer-shaped crown. Like the other garden species of narcissus, in cultivation it is not particular as to soil, but succeeds best in one that is stiff and deep. In Britain, however, they are grown chiefly in pots in the greenhouse, where they flower in March or earlier, being amenable to forcing treatment if required. The name is a shortened form of the Fr. *jonquille*, from the Lat. *juncus*, a rush, in allusion to the long slender leaves.

Jonson, BEN (1573–1637). An English poet and dramatist. Born in Westminster, the posthumous



Ben Jonson.

After Gerard Honthorst

son of a minister of Annandale descent, and on his mother's side of a Cumberland family, he was educated at Westminster School under Camden, may have been a short time at S. John's College, Cambridge, and was eventually, "by their favour not his study," M.A. of Oxford and Cambridge. Disliking his stepfather's trade of bricklayer or mason, he volunteered for service under Sir Francis Vere in Flanders, on one occasion slaying a Spanish soldier and depriving him of his armour in single combat.

Returning about 1592, he married, became an actor, was employed by Henslowe as a hack playwright, fought a duel with a fellow-actor Gabriel Spencer, killed his adversary, was indicted, 1598, at the Old Bailey, and liberated on pleading benefit of clergy. While in prison he became a Roman Catholic, and remained so for twelve years. In 1598 were produced his comedies, Every Man in His

Humour (with Shakespeare in the cast) and The Case is Altered, these being followed in 1599 and 1600 by Every Man Out of His Humour and Cynthia's Revels. The Poetaster, 1601, figures in the stage quarrel (much exaggerated) with Dekker, Marston, and others.

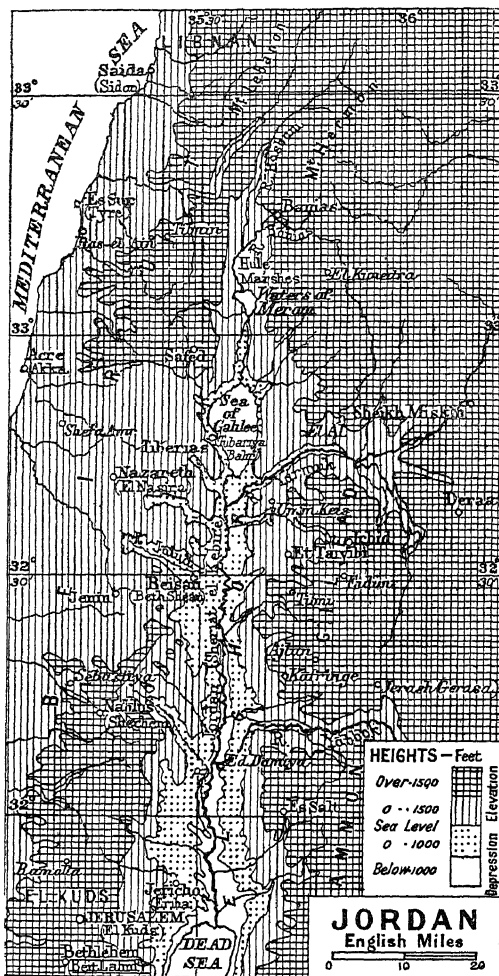
In 1603 Jonson was employed in the pageantry devised to welcome King James to London, and his first extant tragedy, Sejanus, was produced. In 1604–5 came the first of his thirty or more masques. In 1605 he was in prison with Chapman and Marston for reflections on the Scots in their comedy Eastward Hoe, was engaged by the privy council in inquiries relative to the Gunpowder Plot, and completed his tragedy, Volpone, which was staged at The Globe and at both universities. The comedy, Epicoene or The Silent Woman, 1609–10, was followed by The Alchemist, 1610, and Catiline, 1611.

After visiting the Continent as tutor to the son of Sir Walter Raleigh, whom he assisted in his History, he wrote his comedy, Bartholomew Fair, and began his quarrel with Inigo Jones, who invented the stage scenery for the court masques. In 1616 he published his Works, being the first English dramatist to do this, and was granted a royal pension that carried with it the virtual if not the actual title of poet laureate. His play, The Devil is an Ass, was produced in this year.

In 1617–19 he journeyed on foot to Scotland, was made a Burgess of Edinburgh, and visited William Drummond at Hawthornden and Bishop Corbet at Oxford. His account of this journey was destroyed in a fire that consumed his library about 1629. In 1623 he wrote the famous commendatory verses for the First Shakespeare folio. The Staple of News, 1626, was a failure, and with the death of James, and his own illness, Jonson's star began to wane.

In 1628 he was appointed City chronologer. In 1629 came The New Inn, which, with The Magnetic Lady, 1632, and A Tale of a Tub, 1633, failed to find public favour. Four years later he died in comparative poverty and was buried in Westminster Abbey, where his grave bears the epitaph O Rare Ben Jonson. He left a charming pastoral fragment, The Sad Shepherd.

As a dramatist, Jonson at his best afforded a model of unity in conception, as in the clear handling of a plot, and his plays contain some of the most striking



Jordan. Map of the great natural trench, with its floor more than 1,000 ft. below sea level

pictures of the London of his day. As a poet he excelled in lyric verse, the classical example being his transcript from Philostratus, *Drink to me only with thine eyes*. As a prose writer (*e.g.* in his *Discoveries*—notes on his reading) his command of plain, concise expression was unrivalled, except by his friend Bacon. In physique burly, in character manly, and generous as well as satirical, he was one of the first of London clubmen, admired especially by the young wits and poets who were his literary "sons." One of the most learned of English poets, he included among his friends most of his eminent contemporaries.

Bibliography. Works, ed. W. Gifford, 1816; rev. ed. F. Cunningham, 1875; Poems, ed. R. Bell, 1878; Masques and Entertainments, ed. H. Morley, 1890; Conversations, ed. R. R. Patterson,

New York, exploiting a realistic as opposed to classic interpretation of dancing. Jooss was ballet director at Dartington Hall (*q.v.*), 1934–40. His later works include *Company at the Manor*, 1943; *Pandora*, 1944. *See* Ballet.

Joppa. Name by which Jaffa, the seaport of Jerusalem, was known in ancient times, *e.g.* to the Crusaders. (*See* Jaffa.) An eastern suburb of Edinburgh, called Joppa, between Portobello and Musselburgh, has developed round the former residence of a traveller who took the name from the old port.

Jordaens, JAKOB (1593–1678), Flemish painter. Born at Antwerp, May 19, 1593, he studied under Van Noort. Through Rubens, he obtained the patronage of the kings of Spain and Sweden, and the Princess Amelia of Orange, for whom he painted his masterpiece, *The Tri-*

umph of Prince Frederick Henry of Nassau, now in the Huis ten Bosch (House in the Wood), The Hague. He painted the convivial men and women of his time with rare expressiveness. He died of the plague, Oct. 18, 1678. *See* Diogenes illus.



Jakob Jordaens, Flemish painter
Self-portrait

Jordan. A river of Palestine, also known as the Yarden and the Sheriat el Kebire, the great watering-place. It rises in the Mt. Hermon range and flows S. through the Waters of Merom to the Sea of Galilee, from which, falling 1,300 ft. below sea level, it descends into the Dead Sea after a markedly zig-zag course. Its length is about 200 m. Its principal tributaries, both entering it from the E., are the Yarmuk and the Jabbok, or Yab-bok. It occupies the northern part of one of the most celebrated rift valleys in the world. The river makes a narrow valley within the plain, about 5 m. in width; this marks the floor of the rift, of which the sides are precipitous. *Consult* The River Jordan, N. Glueck, 1946.

Jordan, HASHIMITE KINGDOM of. Official name, adopted in 1949, of the country known from 1926 as the kingdom of Transjordan (*q.v.*).

Jordan, DOROTHY OR DOROTHEA (1762–1816). Irish actress. Born near Waterford, the daughter of an actress, she played for the first time in London at Drury Lane as Peggy in *The Country Girl*, Oct. 18, 1785, afterwards impersonating Viola, Rosalind, and Hippolyta, and soon became recognized as an admirable performer of breeches



Dorothy Jordan, Irish actress
After Romney

parts. She remained at Drury Lane, with one interval, until 1809, obtaining her chief successes in such comedy rôles as those of Sir Harry Wildair, Miss Prue, Letitia Hardy, Lady Teazle, Miss Hardcastle, and Lydia Languish. She made her final appearance on the stage at Covent Garden, June 1, 1814, as Lady Teazle, and died at St. Cloud, July 3, 1816. From 1790 to 1811 she was the mistress of the duke of Clarence—afterwards King William IV—and bore him ten children. See *The Story of Dorothy Jordan*, Clare Jerrold, 1914.

Jordanes, less correctly *Jordanes* (6th century A.D.). Historian of the Goths. Belonging to the Alani, a tribe not akin to, though influenced by, the Goths, he wrote two works in Latin, a compendium of history from the Creation to his own times, and a history of the Goths, called *De Origine Getarum* or *Getica*, based on a lost work by Cassiodorus (*q.v.*). *Getica* is an error, as the *Getae* are quite distinct from the Goths. *Jordanes* represents the Goths as the most enlightened of the barbarian tribes.

Jordans. Quaker burial ground in Buckinghamshire, about 2 m. from Chalfont St. Giles. Containing the graves of Milton's friend



Jordans. Meeting House of the Society of Friends in Buckinghamshire

Ellwood, and of William Penn, it is visited by a large number of Americans. At Jordans the Friends met for worship from their earliest days, and in 1671 acquired this piece of ground for a graveyard. The present meeting-house was erected in 1688. A barn near is believed to have been built out of timbers of the Mayflower by the 17th century owner of Jordans. See *Mayflower*; *Society of Friends*.

Jordanus Nemorarius or **TEUTONICUS**. German mathematician of the 12th century. Born probably at Borgentreich, he studied at Paris. His *De Triangulis*, and books on the properties of numbers and algebra, were textbooks of his time. He was one of the earliest mathematicians to use algebraic abbreviations.

Jorgensen, **JOHANNES JENS** (b. 1866). Danish poet and philosopher. Born Nov. 6, 1866, at Svendborg, he became the leader of a literary group which opposed the prevailing school of realism. His essays attracted the attention of Björnson, and his history of Danish literature, 1908, established his fame abroad. Other works include the autobiographical *My Life's Legend*, 1917; *History of a Hidden Life*, 1928; and semi-poetical philosophical volumes from the R.C. standpoint. From 1913 he lived mostly in Italy.

Jörgenson, **JÖRGEN** (1779-1845). Danish adventurer known as *The King of Iceland*, or *The Dog-Days King*. The son of a Copenhagen watchmaker, he was born April 7, 1779. On June 21, 1809, he seized Iceland, looted the treasury, and with a few confederates ruled the island for six weeks, as he claimed, under English protection. Removed to England, he lived there until 1820. He was convicted of robbery and sent to Botany Bay, where he died.

Jorrocks, **JOHN**. A character created by R. S. Surtees (*q.v.*), sporting novelist. A Cockney grocer and would-be sportsman, Jorrocks first appeared in the *New Sporting Magazine*, 1831. The amusing Jorrocks episodes were later collected and published as *Jorrocks's Jaunts and Jollities* (1838). He was also the principal character in *Handley Cross* (1843).

Joseph. Masculine Christian name. It comes from a Hebrew word meaning addition or increase and has always been popular among the Jews. In German it is *Josef*, in Italian *Giuseppe*, in Spanish, *José*. There is a feminine form, *Josephine*.

Joseph. Son of Jacob, the elder by his wife Rachel, and the brother of Benjamin. Born at Haran, until Benjamin's birth he was the favourite son. His jealous brothers sold him to some Midianite merchants, who, in turn, sold him to Potiphar, a high official at the court of Pharaoh. The false charge of attempted adultery by his master's wife led to his imprisonment, where his skill in interpreting dreams brought him to the notice of the king, for whom he performed similar services.

Pharaoh gave him charge of the arrangements for meeting an impending famine, and thus Joseph rose to be prime minister of Egypt. On the arrival of his brothers to buy corn he disclosed his identity and invited his father and family

to Egypt, where they settled in Goshen on the delta of the Nile (Gen. 37-50).

Joseph. Husband of the Virgin Mary and foster-father of Jesus. A native of Bethlehem and a carpenter at Nazareth, he is believed to have died before Jesus commenced His ministry, as there is no mention of him after he accompanied Mary to Jerusalem when Christ was twelve years old.

Joseph. A disciple of Christ, called Barsabas. He was nominated by the apostles as a candidate for the vacancy caused by the apostasy of Judas (Acts 1). He had apparently been a member of the Sanhedrim, and was surnamed Justus.

Joseph of ARIMATHEA. A wealthy Jew of high position, apparently a member of the Sanhedrim, and a secret disciple of Christ. After the Crucifixion, he used his influence with Pilate to obtain possession of Christ's body, which with the aid of Nicodemus he buried in the tomb prepared for himself (Matt. 27; Mark 15; Luke 23). Tradition says that he brought the Holy Grail to Britain and settled at Glastonbury.

Joseph I (1678-1711). German king and Roman emperor. The elder son of the emperor Leopold I, he was born in Vienna, July 26, 1678. Possessing cultured tastes, he was made king of Hungary in 1687 and king of the Romans in 1690. Having seen military service during the War of the Spanish Succession, he became emperor during its progress, 1705. He died April 17, 1711, and was succeeded by his brother Charles.

Joseph II (1741-90). German king and Roman emperor. The eldest son of the empress Maria Theresa and her husband,

Francis of Lorraine, he was born March 13, 1741. His talents were not systematically trained, but he showed himself industrious, with a high if mistaken idea of duty. In 1761 he began to take part in affairs of state, and in 1764 was chosen king of the Romans. In 1765, on the death of his father, he became emperor and his mother's colleague in the government, but Maria Theresa remained the dominant personality. Joseph met Frederick the Great, Catherine of



Joseph II, Holy Roman emperor

Russia, and some of the great Frenchmen, with whom he had conversations that had influence on the policy of his reign.

In Nov., 1780, Joseph became actually ruler of Austria and the other Hapsburg lands. He put in hand a series of reforms, beneficent in the main, e.g. a great measure of religious toleration, but they were too sudden to be generally acceptable. In foreign politics he tried to secure Bavaria and to add to his dominions elsewhere, while in 1788 he carried on a short war with the Turks; but as in domestic, so in foreign enterprises he failed. In 1789 Hungary and the Netherlands were in revolt. He died Feb. 20, 1790. Twice married, he left no children, and his successor was his brother, Leopold II. Joseph followed the political philosophy known as benevolent despotism.

Joseph, PÈRE (1577-1638). A French monk and diplomatist.

François Leclerc du Tremblay spent his youth in travel and under arms, but in 1599 entered the Capuchin order. His intimacy with Richelieu began when the latter was bishop of Luçon, about



Père Joseph,
French monk

1612. He took part in the negotiations at Loudun, 1616, and thenceforward his life was devoted to the R.C. cause in France. Known as the Eminence Grise, he was a trusted agent of Richelieu in important negotiations, e.g. at the diet of Ratisbon, 1630. He died at Rueil, Dec. 18, 1638. *Consult* Grey Eminence, A. Huxley, 1941.

Joseph Andrews. Novel by Henry Fielding published in Feb., 1742, with the full title of *The History of the Adventures of Joseph Andrews and his Friend, Mr. Abraham Adams*. Its author's first novel, it was frankly begun as a parody of Richardson's *Pamela*. The story is the most humorous of Fielding's novels.

Josephine, MARIE ROSE (1763-1814). Empress of Napoleon I. Daughter of Joseph Tascher de la Pagerie, she was born at Trois-Îlets, Martinique, June 24, 1763, and in 1777 was married to the viscount de Beauharnais. Her husband was guillotined as an anti-revolutionist in July, 1794, leaving her with a son Eugène and a daughter Hortense. Well known in political circles in Paris,

in 1796 she married Napoleon Bonaparte, then on the point of leaving for the Italian expedition.



Josephine

After François Gerard

He overlooked her infidelities during his absence abroad, and, after a religious ceremony of marriage had been performed, she was crowned empress in 1804, and queen of Italy in 1805. Mutual jealousies, however, and the barrenness of the union, caused Napoleon to divorce her in Jan., 1810, an act which gained for her the sympathy of her enemies. Thereafter Josephine lived in retirement at La Malmaison, near Paris, where she died May 29, 1814. *See* Fontainebleau; *consult* Lives, P. W. Sargeant, 1908; C. S. Forester, 1925; R. M. Wilson, 1930; Napoleon and J., W. Geer, 1925; In Search of Two Characters, D. Creston, 1945.

Josephus, FLAVIUS (A.D. c. 37-c. 100). A Jewish historian and revolutionary leader. Born at Jerusalem, of distinguished priestly lineage, he was trained in the schools of the Pharisees, Sadducees, and Essenes. When the Jewish rebellion broke out he was at first disinclined to join it, but having once done so, he threw himself into it with energy. After the gallant defence of Iotapata, he was taken prisoner, but afterwards released by Vespasian, whose favour he won by prophesying his accession to the throne. He then assumed the name Flavius, that of the imperial house.

After the capture of Jerusalem (70), at which he was present, he went to Rome, where he enjoyed the patronage of Vespasian, Titus, and Domitian. He was granted Roman citizenship, together with estates in Judea.

His works, the style of which gained him the title of the Greek Livy, are (1) *The Jewish War*, in seven books, originally written in Aramaic and translated by himself into Greek, pro-Jewish propaganda; (2) *Jewish Archaeology*, or *Antiquities of the Jews*, in twenty books, a sketch of the history of the Jews from the earliest times to 66, in which his treatment of certain incidents shows a rationalistic tendency, and he makes considerable use of non-biblical authorities. The passage

in which Christ is mentioned (18) is not considered genuine, at least in its extant form; (3) *Autobiography*, also containing an answer to criticism of his attitude during the war; (4) *Against Apion*, a defence of Judaism generally against the attacks of Apion, an Alexandrian grammarian, and others. The best English translation of the complete works is still that of W. Whiston, 1737, rev. ed. D. S. Margoliouth, 1906.

Joshua. Book of the Old Testament. It is so called because it gives an account of the exploits of Joshua, the son of Nun, who succeeded Moses as leader of the Israelites into the Promised Land. It falls into three divisions: (a) History of the Conquest of Canaan, 1-12; (b) Division of the conquered territory, 13-21; (c) Joshua's addresses to the tribes, with an account of his death and burial 22-24. In the Hebrew Canon it is the first in the group of books called the Former Prophets. The only poetical passage in the book (10, vv. 12, 13) is stated to be an extract from the Book of Jasher. *See* Hexateuch; Bible; Criticism, Biblical.

Josiah. King of Judah c. 639-608 B.C. He succeeded his father Amon at the age of eight years. During repairs to the Temple the lost book of the law—apparently our Book of Deuteronomy—was found and brought to him. Greatly affected by its perusal, he set to work to cleanse the land of idolatry. Years of peace and prosperity followed, until Pharaoh Necho came with an army to fight against the Assyrians. Josiah, alarmed for the independence of his kingdom, attacked him, and fell in the fighting at the battle of Megiddo (2 Kings 22-23).

Joss (Chinese pidgin-English of Portug. *deos*, god). Pidgin-English term used in connexion with sacred objects, as joss-house for a church or temple, joss for idol, joss-sticks for the incense sticks burned before Chinese idols, etc.

Jostedals Brae. Ice-field of S.W. Norway, in the co. of Sogn og Fjordane. Situated between the Sogne and Nord fjords, W. of the Sogne Fjeld, its highest point is 7,694 ft. It is the largest glacial field or continuous ice mass on the Continent, having an area of about 365 sq. m.

Jotun. Name given to the races of giants in Norse mythology. They lived in Jotunheim, N. of the frozen river Elivagar, and were monstrous and evil. They were symbolical of frost and winter.

and Thor, the god of thunder, waged constant war against them.

Joubert, PETRUS JACOBUS (1834-1900). A Boer soldier and politician. Born Jan. 20, 1834, in Oudsthoorn dist., Cape Colony, he



Petrus J. Joubert,
Boer soldier

was of Huguenot descent. He became prominent as commander-in-chief of the forces of the South African Republic, when he defeated the British at the battles of Laing's Nek, Ingogo, and Majuba in the Boer War of 1880-81. Between the first and second Boer Wars, Joubert was identified with the moderate party in the Transvaal which favoured liberal treatment of the Uitlanders in opposition to the reactionary policy of Kruger.

In 1893 Joubert stood for the presidency against Kruger, losing by only 800 votes. On the outbreak of the war with Britain in 1899 he was in chief command, and the result of his careful preparation bore fruit in the initial Boer successes. The rigours of campaigning, however, proved too hard, and he died at Pretoria, March 27, 1900.

Joubert (DE LA FERTÉ), SIR PHILIP BENNET (b. 1887). British air force officer.



Sir Philip Joubert,
British air force
officer
Howard Coster

Born May 21, 1887, he passed through Harrow and the R.M.A., Woolwich, and was commissioned in the Royal Artillery before being seconded in 1913 to the R.F.C. He was promoted air commodore in 1929 and next year commandant at the R.A.F. staff college. He became A.O.C.-in-C., Coastal Command, in 1936, and returned to that position as an air chief marshal, 1941-43. Meanwhile he had acted as B.B.C. war commentator on air operations. Retiring in 1945, after service on the headquarters staff of S.E.A.C., he was director of public relations at the Air Ministry, 1946-47. His knighthood was conferred in 1938. Sir Philip wrote for this work the articles on Coastal Command and Pacific War 1941-45.

Joule. Unit of work or energy equal to 10^7 erg. It is defined electrically as the amount of energy

dissipated in 1 sec. by an unvarying current of 1 amp flowing through a potential difference of 1 volt. Thus:

$$E = QV = IVt = I^2Rt,$$

where E is the energy in joules, Q the quantity of electricity in coulombs, V the potential difference in volts, I the current in amperes, R the resistance in ohms, and t the time in secs. See also International Units.

Joule, JAMES PRESCOTT (1818-1889). A British physicist. Born Dec. 24, 1818, at Salford, he studied



J. P. Joule,
British physicist

under the chemist Dalton. An invalid, he was compelled to work at home, where he took up the study of electricity and magnetism. At 19 he published his first paper On an Electro-magnetic Engine. He was the first to measure an electric current, to discover that the heat produced in an electric circuit is proportional to the resistance and to the square of the current, and to establish the equivalence of heat and energy. His experiments to ascertain the mechanical equivalent of heat (1843-78; see Energy) set a new standard of accuracy for scientific research. He received the Copley medal in 1860 from the Royal Society, of which he had been made a fellow ten years previously. He died Oct. 11, 1889.

Joule's Equivalent, or the MECHANICAL EQUIVALENT OF HEAT (J). This is defined by the first law of thermodynamics: $E = JH$, where H are units of heat energy (calories), which correspond to E units of mechanical energy (ergs). Modern experiments give $J = 4.1855 \times 10^7$ erg per calorie. See Energy.

Joule-Thomson Effect or JOULE-KELVIN EFFECT. Principle of physics. Most gases on expansion through a porous plug experience a lowering of temperature which is proportional to the pressure difference between the ends of the plug. Hydrogen and helium show a heating effect at ordinary temperatures, but at a sufficiently low temperature a cooling is observed. The cooling effect is explained as due to the performance of internal work in overcoming the mutual attraction of the gas molecules. This effect is applied in the liquefaction of gases.

Jourdan, JEAN BAPTISTE (1762-1833). French soldier. Born at Limoges, April 29, 1762, the son of a surgeon, he



Jourdan
After Isabey

joined the forces raised to serve against Britain in America during the War of Independence. He stayed there in business, but entered the French army on the outbreak of the Revolution, and in 1793 was a general with an army under him; with this he defeated the Austrians notably at Wattignies and Fleurus, thereby clearing the way for the French advance to the Rhine.

In 1796 he took part in the advance into Germany, but after some successes his army was driven back with heavy loss, and he was consequently relieved of his command. He then turned to political life, from which he emerged in 1799 again to command an army. Again he was beaten and retired, but he retained or regained the favour of Napoleon, who employed him in a civil capacity in Italy. He was in Spain during the Peninsular War as military adviser to Joseph Bonaparte. In 1814 Jourdan joined the Bourbons, but he returned to Napoleon's side on the escape from Elba, only to desert his lost cause again in 1815. He was honoured by the restored king, who made him a count—Napoleon had already made him a marshal. In 1830 he joined the popular side and for a short time was foreign minister. He died in Paris, Nov. 23, 1833.

Journal (Fr. *jour*, day). Term applied to a daily record. It is used in several senses. (1) For a daily newspaper (most commonly used in France); from this the word journalism is derived. (2) For a diary, narrating the travels and other experiences of individuals. (3) For a record of the proceedings of a public body, e.g. the Journals of the Houses of Lords and Commons, and of various learned societies. (4) For a book used in double-entry bookkeeping, intermediate between the day-book and the ledger, and intended to facilitate entries into the latter. See Bookkeeping; Newspaper.

Journal. In engineering, that part of a shaft in contact with a bearing which supports it, or which it supports. See Shaft.

JOURNALISM IN GREAT BRITAIN

Stewart Nicholson, Gen. Sec., Institute of Journalists

Specific aspects of this subject are treated under Censorship; Editor; Freedom of the Press; Leader; Libel; Newspaper; Reporting, etc. See also articles on the leading newspapers in the U.K. and abroad, and biographies of leading journalists, newspaper proprietors, etc.

The practice of journalism in Britain dates from the 17th cent. The earliest writers entitled to the name journalist were the writers of news-letters, produced often in manuscript, and news-books or pamphlets. But it was not until March, 1702, the year of Queen Anne's accession, that London's first daily newspaper, the Daily Courant, made its appearance, to be followed in 1719 by the Daily Post, one of whose contributors was Daniel Defoe, regarded as the father of British journalism.

Oldest surviving London daily newspapers are Lloyd's List and Shipping Gazette (1734), the Public Ledger (1759), now devoted to mercantile and shipping interests; The Times (1785), known for its first three years as the Daily Universal Register; and the Morning Advertiser (1794), from its origin the organ of the licensed victuallers. Pride of place among existing English provincial newspapers is claimed by Berrow's Worcester Journal, which dates from 1690, while Scotland's earliest paper still in existence is the Press and Journal, Aberdeen, which dates from 1748, when its component, the Aberdeen Journal, was founded.

British Newspapers in 1948

London in 1948 had 12 morning, three evening, and 9 Sunday newspapers. In the English and Welsh provinces there were 20 morning, 68 evening, and 5 Sunday; in Scotland 6 morning, 9 evening, and 2 Sunday; in Northern Ireland 4 morning, 1 evening. Greater London has 97 weekly newspapers, the English and Welsh provinces 989, Scotland 168, Northern Ireland 45. There were nearly 4,000 periodicals and magazines, and the principal London weeklies (illustrated, trade, technical, women's, etc.) numbered 202.

Despite the impressive numbers and the enormous circulations of newspapers and periodicals, journalism, as practised in the U.K., is a small profession. The total number of journalists engaged on newspaper staffs is placed at under 11,000, of whom not more than 2,000 are employed in Fleet Street. It is not possible to compute accurately the number of whole-time, unattached journalists, known pro-

fessionally as free lances, but these probably do not exceed 1,500.

Indicative of the numerical smallness of the numbers in journalism is the fact that for every staff journalist employed seven to nine workers of other classes are required in newspaper production. Assuming that entry to journalism takes place on the average at the age of 16, and allowing for a mortality rate similar to that of the general pop. of the country, and for those who leave the profession, the annual intake cannot be put at more than 300.

No special educational qualifications are required to become a journalist, and there are no entrance examinations. For 20 years up to 1939 a diploma course in journalism was conducted on strictly practical lines at the university of London, and served a most useful purpose. Its abandonment left Great Britain without any university course in journalism. A certain number of journalists, actually a small proportion, do enter the profession from the universities, but graduation with an arts or some other degree offers no guarantee of acceptability or advancement as a journalist, although a knowledge of languages has advantages.

NEWSPAPER JOURNALISM. Journalism is distinct from other vocations in that practical experience is all-important and theoretical knowledge counts for little. The average age of entry is 16-17 and the general method is to begin as a learner or junior, preferably on the staff of a local weekly newspaper. Formerly the indentured apprenticeship system was fairly common, but this has been superseded by the learner system, which is designed to give the entrant comprehensive practical training.

The entrant to journalism, if he is to succeed, should be well-read, possess a sound knowledge of English, and be able to write simply and grammatically. He should have, or quickly make it his business to attain, proficiency in shorthand (120 words a min.) and typewriting (60 words a min.). As the work is both mentally and physically exacting, good health is necessary. The entrant must be readily adaptable, adaptability

being one of the chief qualities of a journalist, develop keen powers of observation, and show initiative and resource. He should also have a good presence, be pertinacious yet tactful, and strive to overcome self-consciousness. He will normally begin in the reporters' room, where he will be under the supervision of the chief reporter or news editor. At first he will learn to make calls, write simple reports, and otherwise participate in the day-to-day work of a newspaper office.

A newspaper's primary purpose is to give the public the news, and upon the reporter falls the responsibility of news-gathering. Reporting is the foundation of all the best journalistic work. Ability to write is not nearly enough, for journalism is not authorship. The reporter must have a "nose" for news, a sense of news values, and a sharp realization of the fact that news which is not printed while it is still news is valueless. Time is the essence of the technique of newspaper production.

Essentials of Reporting

The first essential of reporting and, indeed, of all journalism, is accuracy. A newspaper's reputation for fairness and reliability rests upon accurate presentation of news. It is imperative, therefore, that the reporter should earn a reputation for reliability and this can best be earned by exercising the greatest care in making inquiries, respecting strictly the many confidences received from personal contacts with people, keeping appointments punctually, turning out "copy" promptly, and observing scrupulous fairness in all that is said and written.

Journalism is a highly technical profession, and it is not derogating from the status of the reporter to describe the sub-editor as the supreme technician. The sub-editor has to deal not only with the reporter's "copy," but with all the mass of other news material pouring into the office. Upon him devolves the duty of selecting, revising, and preparing for the printer the news in its final form, of making up the paper in the format considered most suitable, and of sending the paper to press. He has, in fact, the power of life or death over the matter which he handles, and the ultimate responsibility for the attractiveness of the paper to the reader is his.

The sub-editor has invariably graduated from the reporters' room. Invariably, also, promotion to the editorial chair or other

executive rank lies through the sub-editors' room. The sub-editor must have expert judgement of news values, an acute awareness of the dangers of libel and contempt of court, and a shrewd knowledge of men and affairs, combined with a keen vision of the world which is coming under the censorship of his pencil. He must also, as a skilled craftsman, reveal capacities for rewriting, clean cutting, apt headlining, and rapid but sound workmanship.

From the fundamentals of reporting and sub-editing, the practice of journalism spreads in many branches. The range of journalism has inevitably extended to cover every subject in which public interest is manifested, and no profession offers wider scope for the mental faculties. Paradoxically, perhaps, in consequence of the organization of editorial activities into various separate compartments, the functions of the editor himself have become increasingly more directed to administrative tasks than to purely journalistic duties, with sometimes more concentration on the managerial than on the "writing" side of the paper.

Place of the Specialist

Usually a young journalist quickly feels the urge for specialisation. This is hard to resist, but it is pertinent to point out that, with very few exceptions, the successful specialist is a trained technician, qualified as a general news reporter or sub-editor, or both. Sports journalism is easily the biggest field of specialisation, more space being given to sport than to any other one subject. The small local weekly, no less than the large daily, has its sports page, and the sports editor is in an enviably detached position of authority and prominence.

Most newspapers of any size or standing give specialist attention to politics, industry, international affairs, finance and commerce (second to sport in point of size of separate staff), health, science, agriculture, food, and gardening, motoring, aviation, social life and domestic interests, and, of course, entertainment, literature, and the arts—book reviewing, music, architecture, broadcasting, theatres, and films. Remarkable developments in photography, such as telegraphed and televised pictures, have given illustrations a vitally important place in editorial technique, and the press photographer now enjoys the same economic status as the reporter. Although

only one national newspaper—the *Times*—still maintains its own staff of parliamentary reporters, the political correspondent and commentator holds his ground, with the industrial or labour correspondent a close second.

Opportunities for the specialist writer are unbounded. At Westminster the parliamentary correspondent may be in the press gallery doing descriptive sketches of the debates, or in the lobby maintaining personal contacts with ministers and M.P.s, a liaison officer between parliament and the public. The industrial expert and the writer on finance and commerce have similarly to show the utmost vigilance and perspicacity. The foreign correspondent, like the sentinel, is always at his post as a member of the ambassadorial corps of journalism. Writers on scientific subjects, art, music, theatres, and films have the advantage of operating in worlds of their own. Inside the office the leader writer has the concentrated task of expressing the views and the policy of his paper.

PERIODICAL JOURNALISM. Trade and technical journalism is manned almost entirely by specialists. Almost every kind of industrial activity and all the professions have journals representing their own interests. There are technical papers dealing with journalism itself. It is not extravagant to say that in variety and quality Britain's trade and technical press leads the world, although closely rivalled by that of the U.S.A.

The specialist aspect is also prominent in periodical journalism, which provides most openings for women journalists. A general journalistic training, however, is the best background so far as a staff post is concerned. Periodical staffs are very small compared with those of newspapers: much of magazine and periodical work comes within the category of free lancing.

FREE LANCING. The first essential for the free lance is to build up a practice, i.e. to establish contact with a circle of editors to whom he can look for regular commissions. The specialist writer is always the most successful free lance. Intensive study and expert knowledge of the markets available can and do bring handsome rewards; but while free lancing has a fine spirit of independence and freedom it is at the best exacting and hazardous, demanding strong qualities of ingenuity, endurance and punctuality, and,

above all, an unflinching capacity for sheer, hard work.

RADIO JOURNALISM. The radio news services are a rapidly developing field for journalists. One of the objects in the charter of the B.B.C. is "to collect news and information in any part of the world," and to this end the Corporation has its own resident correspondents in the Continental capitals, the U.S.A., the British dominions, and other overseas countries. It also sends special correspondents to cover particular events of outstanding news importance. The B.B.C. regions have news services on a modest but efficient scale to supply local news. But at home as well as abroad reliance for the main supplies of broadcast news is placed on the agencies serving the newspapers.

NEWS AGENCIES. Reuters, the Press association, the Exchange Telegraph co., the British United press, the Associated press, and others are inexhaustible and indispensable reservoirs of news. The practice of journalism would be impossible without them today, since the business of dealing with news is secondary to that of getting it. No daily newspaper, however great its resources and marked its individuality, could by itself secure universal coverage of news. Agency services may be supplementary to the work of a paper's own regular correspondents, but they are a safeguard that nothing of importance anywhere, nothing that makes news, will be missed.

In the British Dominions

Hopeful young journalists are always attracted by professional possibilities overseas, but the days when one could pack a suitcase, take ship, and walk into a job on landing are gone. It is now necessary to have a job to go to, and even so the young adventurer will not find things easy. In Australia and Canada, as in the U.S.A., there are no national newspapers in the British sense, circulations being confined almost entirely to the state or prov. in whose cities daily papers are published. In S. Africa a knowledge of Afrikaans and in Canada of French, as well as of English, is desirable. Although there are always a limited number of overseas openings for experienced men, opportunities abroad are restricted by economic and other problems of a similar nature to those facing the newspaper industry in Great Britain in the period following the Second Great War

In Great Britain remuneration and working conditions of reporters and sub-editors are governed by agreements negotiated between the newspaper proprietorial bodies and the journalists' organizations. The minimum rates for the provinces range at the age of 24 from £6 9s. 6d. to £8 1s. 0d., according to the size of the town, with a 44-hour week for weekly newspapers, a 42-hr. week for evenings, and a 40-hr. week for mornings, expressed in four-weekly periods. In London (Fleet Street) there is a 12-guinea minimum salary for reporters and sub-editors (with three or more years' experience) on the daily and Sunday papers; journalists on financial papers; journalists on sporting papers who have served three years as sports journalists; press photographers with three or more years' experience as photographers. A five-day week of 40 hrs. is provided for day workers and a five-night week of 35 hrs. for night workers. There is no recognized difference in pay or working conditions for women engaged on men's work.

In the British Isles there are two professional organizations of journalists. The senior body, the Institute of Journalists, was incorporated by royal charter in 1890, and is also a certificated trade union. The National Union of Journalists, formed in 1907, is a registered trade union. Professional organizations overseas include the Australian journalists' association, the New Zealand journalists' association, the S. African society of journalists, the American newspaper guild, and the Jamaica press association.

Journalists, INSTITUTE OF. Association of British journalists founded at Birmingham, Oct. 25, 1884. It was incorporated by royal charter in March, 1890. As a registered trade union, it is recognized by proprietors' organizations as a negotiating body on salaries and working conditions. It maintains an employment register and administers funds for the assistance of members. The institute comprises junior members, members, and fellows, and two non-professional classes, associates and honorary members. In 1946 members of the institute balloted to merge with the National Union of Journalists (*v.i.*). The h.q. is at Tudor Street, London, E.C.4.

Journalists, NATIONAL UNION OF. Professional society of British working journalists, inaugurated at Manchester in 1906. Proprietors, directors, and managers of news-

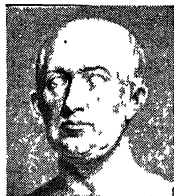
papers are not admitted to membership. In 1946, members of the union and of the Institute balloted in favour of a proposal to merge. Rules, for submission to a joint delegate conference in March, 1948, and the parl. bill necessary to give effect to the merger were drafted during 1947, but after another ballot the proposal was abandoned at the end of 1948. The N.U.J. offices are at 96 Regent St., London, W.1.

Journey's End. A drama by R. C. Sherriff. This play with an all male cast, written for a Kingston amateur company, was given its first professional performance by the Stage Society at the Apollo Theatre, London, Dec. 10, 1928. Produced at the Savoy the following month, it ran for 594 performances, and was revived at the Criterion in 1934. The scene is set in a dug-out on the Western front in 1918, during the First Great War. It was the first play to present that war with frank realism. Sherriff collaborated with V. Bartlett in a novel of the same name, 1930.

Joust. Word of French origin, meaning to run together, or tilt at each other. It is used specially for the encounter of two knights in a tournament. This jousting, with or without the more elaborate setting of the tournament, was popular among knights. *See* Tournament.

Jove. Popular name of Jupiter, the chief deity of Roman mythology. It comes from old Lat. *Jovis*, which reappears corrupted in Jupiter, *i.e.* *Jovis pater*, father Jove. *See* Jupiter.

Jovellanos, GASPER MELCHOR DE (1744-1811). A Spanish politician and man of letters. Born



G. M. de Jovellanos,
Spanish statesman
From a bust

at Gijón, Jan. 5, 1744, he was educated at the university of Avila and at Madrid. He became a magistrate in Seville, a councillor in Madrid, and minister of grace and justice during 1797-98. He projected numerous educational reforms. At the revolution of 1808 he joined the junta in power. His great work on Legislation in Relation to Agriculture made his name familiar throughout Europe. His treatise on Education gives him a prominent place in the pedagogy of 18th cent. Spain. His letters are valuable, and he wrote much verse. Died Nov. 27, 1811.

Jovian. Roman emperor from June, 363, to Feb., 364. A native of Upper Moseia, and an officer of



Jovian,
Roman emperor
From a coin

the imperial guard, he was proclaimed emperor by the soldiery after the death of Julian in the Persian campaign. Jovian was compelled to conclude a humiliating peace with Persia, involving the surrender of five provinces. Within eight months of his accession, he was found dead at Dadastana, in Bithynia, and was succeeded by Valentinian.

Jowett, BENJAMIN (1817-93). British scholar. Born at Camberwell, April 15, 1817, he was educated at S. Paul's and Balliol College, Oxford. In 1838 he was elected fellow and in 1842 tutor of Balliol, being ordained the same year. His early studies were in theology, and he passed from the evangelical school of his youth to attach himself to the Liberal party in the Anglican Church. In 1855 he was chosen professor of Greek, and in 1870 was made master of Balliol, retaining that position until his death, Oct. 1, 1893.

Jowett was the most prominent figure in the Oxford of his day, and his mastership raised Balliol to a proud pre-eminence among the colleges. His influence was as extraordinary as were the successes of his pupils, both in the university itself and in the world without. He was an advocate of university reform and of wider education generally. As a Greek scholar his best work was done on Plato. His theological writings made him suspect to the orthodox, and there was much bitter feeling when his enemies took steps to deprive him of his salary as professor. Endless stories are told of Jowett's conversations, shrewd yet full of unexpected remarks. *Consul's Life and Letters*, ed. E. Abbott and L. Campbell, 1897.

Jowett, FREDERICK WILLIAM (1864-1944). A British labour leader, one of the founders of the



B. Jowett

Independent Labour party in 1893. Born at Bradford, Jan. 31, 1864, he was a millworker as a boy; he rose to be city councillor, alderman, and chairman of the public health committee in Bradford, and one of the city's representatives in parliament, 1906-18, 1922-24, and 1929-31. He was first commissioner of works in the Labour government of 1924. When the I.L.P. broke with the Labour party he retired from parliamentary life, dying Feb. 1, 1944.

Jowett, JOHN HENRY (1864-1923). A British Nonconformist preacher. Born near Halifax, Aug. 25, 1864, he was educated at Hipperholme grammar school and Edinburgh university before studying for the Congregational ministry at Mansfield College, Oxford. From appointments in Newcastle-on-Tyne and at Carr's Lane, Birmingham, he went in 1911 to become minister of the Presbyterian church in Fifth Avenue, New York; during 1918-22 he was at the Westminster Chapel, London. His preaching always attracted very large congregations. He died Dec. 19, 1923.

Jowitt, WILLIAM ALLEN JOWITT, 1st Viscount (b. 1885). British lawyer and politician. He was born at Stevenage, April 15, 1885, and educated at Marlborough and New College, Oxford. Called to the bar in 1909, he was soon recognized as one of the ablest of the young lawyers. He took silk in 1922 and entered parliament the same year as Liberal member for Hartlepool until 1924. Joining the Labour party, he was M.P. for Preston 1929-31, and he was appointed attorney-general. He continued in office in the National government, but failed to secure reelection to parliament, and in 1932 resigned. He appeared in the sensational "Rasputin" libel case in 1934. Jowitt was solicitor-general, 1940; paymaster-general, 1942; minister without portfolio, 1942-44; minister of Social Insurance, 1944-45. He was lord chancellor in the Labour govts. of 1945 and 1950. Knighted 1929, he was raised to the peerage in 1945, and became a viscount in 1947.

Joyania. Capital of the state of Goyaz, Brazil, formerly known itself as Goyaz. It stands on the Vermelho river, on the N. side of the Serra de Santa Rita, at an alt. of nearly 2,000 ft., 650 m. N.W. of Rio de Janeiro. The chief buildings are a cathedral, governor's palace, schools, churches, and a town hall. Goyaz was

founded by Bartholomew Silva towards the end of the 17th century. Pop. 21,500.

Joyce, JAMES AUGUSTINE ALOYSIUS (1882-1941). An Irish author. Born in Dublin, Feb. 2, 1882, and educated at the university there, he studied medicine in Paris, taught English in Trieste, and during the First Great War lived at Zürich, Switzerland. He then settled



James Joyce,
Irish writer

in Paris. Chamber Music, 1907, a volume of lyrics, gave little indication of his later development, but in 1914 with Dubliners (the publication of which was delayed nine years as the publishers had wanted certain passages omitted) Joyce established his reputation. The sensitive Portrait of the Artist as a Young Man, serialised in The Egoist, 1914-15, marked the end of his first phase.

His principal work, Ulysses, begun in 1914, and serialised in The Little Review, 1918-20, was published in Paris, 1922, but banned in Great Britain and the U.S.A. In this book, and more obscurely in Finnegans Wake, 1939 (published in sections under various titles over some 10 years), Joyce attempted by coining words and other devices to convey the processes of unconscious thought before its formulation by the mind. He made extensive use of the "interior monologue," and in Ulysses spread out to an "odyssey" of a thousand pages the sequence of impressions during 24 hours. Joyce, who died at Zürich, Jan. 13, 1941, had a far-reaching influence on the technique of younger writers. See English Literature; consult biographies by L. Golding, 1933; J. Levin, 1944; A Skeleton Key to Finnegans Wake, T. Campbell and H. M. Robinson, 1947.

Joyce, WILLIAM (1906-1945). Traitor of American birth. Born in New York, April 24, 1906, of an Irish father and an English mother, he was taken by his parents to Ireland in 1909, and later to England. Between 1923 and 1939 he engaged in fascist and national socialist political activities in England. For a time he was "director of propaganda" of the British Union of Fascists. In 1937 he broke away from the B.U.F. and set up a national socialist league. Joyce

left England for Germany on Aug. 25, 1939. Throughout the Second Great War he broadcast Nazi propaganda in English to Great Britain. The British public gave him the nickname of Lord Haw-haw, his identity being for some time unknown. His final broadcast was on April 30, 1945. He was captured near the Danish frontier on May 28 by two officers of the British 2nd Army. On Sept. 17 he was charged with high treason at the central criminal court (Old Bailey), London, and after a three-day trial was found guilty and condemned to death, a decision confirmed by the court of criminal appeal and the house of lords. He was hanged at Wandsworth gaol, Jan. 3, 1946. The record of his trial, ed. C. E. B. Roberts, was published that year.

The main legal interest in the trial of Joyce arose from the extension it involved in the legal conception of allegiance to the British crown. A person can be guilty of treason only if he owes allegiance to the crown. All British subjects owe allegiance, and it has always



William Joyce,
"Lord Haw-haw"

been recognized that aliens owe a temporary allegiance so long as they reside in Great Britain. Joyce was, however, proved to be an American by birth (he acquired German nationality by naturalization in Sept., 1940) and his broadcasting, which constituted the alleged treason, did not begin until his arrival in Germany in 1939. Could an alien owe allegiance after he had left the British commonwealth? This point had never arisen in any previous recorded case; but in a legal work, Crown Cases, by Sir Michael Foster (1689-1763), reference is made to a resolution of the judges in 1707 declaring that if an alien "seeking the protection of the crown and having a family and effects here should during a war with his native country go thither and there adhere to the king's enemies for purposes of hostility he might be dealt with as a traitor. For he came and settled here under the protection of the crown, and though his person was removed for a time his effects and family continued still under the same protection."

Joyce left no family or effects behind him; but it was argued,

and held by the courts, that the judges' resolution meant that an alien owed allegiance even after he had left England so long as he enjoyed the protection of the crown. A person holding a British passport thereby enjoys that protection, and as Joyce held a British passport which did not expire until July 2, 1940, the courts held he owed allegiance until that date. In broadcasting for the Germans before that date he was therefore guilty of treason. *See* Fascists, British Union of; Haw-haw, Lord.

Joyeuse Entrée (Fr., joyous entry). Charter granted to Brabant by Duke John III in 1354. The name arose from the fact that the agreement was ratified by his daughter and successor, Johanna, on the occasion of her marriage to Duke Wenceslaus of Luxemburg and their entry into Brussels in 1355. The main provisions were the appointment of natives to official positions and the forfeiting of sovereign rights by a ruler failing to observe these conditions. *See* Brabant.

Juan de Fuca. Strait or channel between Vancouver Island and the state of Washington, U.S.A. It connects the Gulf of Georgia with the Pacific Ocean, and forms part of the boundary between British and U.S. territory. It is about 80 m. in length and from 10 m. to 18 m. broad.

Juan Fernandez. Island group in the Pacific Ocean. Belonging to Chile, they are 360 m. W. of Valparaiso, lat. 80° W. Mas-a-tierra, the largest island, is also known as Juan Fernandez island. Mas-a-fuera and Santa Clara complete the group. Mas-a-tierra is 12 m. by 3½ m. and Mas-a-fuera 6 m. by 3½ m. The name of the former means nearest land, and of the latter that farthest away. All the islands are of volcanic origin, elevated in the middle, with forested valleys leading to the bays which extend between great stretches of steep cliff coast that is sometimes over 1,000 ft. high. Mas-a-fuera is very difficult of access and uninhabited. The islands are projections from a submarine ridge, and the flora has some associations with the Chilean and Magellanic

species, though it is uncertain how these plants reached there.

Mas-a-tierra was discovered by Juan Fernandez c. 1565. On it a Scotsman, Alexander Selkirk, lived alone during 1704-09, and his adventures furnished Defoe with the groundwork of Robinson Crusoe and inspired a poem by Cowper. Spaniards settled on the island in 1750, near Cumberland Bay on the N. coast, and it was used as a penal station by Chile until 1913.

Juang. Primitive hunting tribe in the Keonjhar and Dhankanal mahals, Orissa province, India. They are also called Pattua (Hind., leaf-wearers). Numbering a few thousands and speaking a Mundarian dialect, they may be the most archaic descendants of the aboriginal Stone Age population. Until recently the women wore beaded string-girdles with leaf-tufts before and behind. The family huts are very small; unmarried boys and girls respectively use communal sleeping-huts.

Juarez. Town of Argentina, in the prov. of Buenos Aires. About 275 m. by rly. S.S.W. of Buenos Aires, on the line to Bahia Blanca, it is the centre of a wheat district.

Juarez, BENITO PABLO (1806-72). President of Mexico, 1858-72. Born March 21, 1806, of Indian parentage. in the state of Oaxaca,

S. Mexico, he studied law and became a judge. When Oaxaca declared its independence in 1846, he became one of the voting triumvirate.

On the federal restoration in 1847 he was a member of the constituent congress, and governor of Oaxaca.

In 1853, on Santa Anna's return to power, Juarez was exiled and

lived for two years in New Orleans. On the revolt against Santa Anna, 1855, he returned, and at the beginning of 1858 was elected president, but had to retire to Vera Cruz, where he set up his government. In 1861 he entered Mexico City, but he was again driven out by the French, who sought to establish the Austrian archduke Maximilian as emperor. After the shooting of Maximilian, 1867, Juarez was re-elected president, and again in 1871. He died July 18, 1872.

Juba or **JUB.** River of E. Africa. Rising in the mountains of S. Abyssinia, it flows in a southerly direction to the Indian Ocean, which it enters a little N. of Kismayu. It is navigable for shallow draught steamers for nearly 400 m. The crossing of the Juba, Feb. 17-20, 1941, by S. and E. African troops initiated Gen. Cunningham's victorious campaign against the Italians. *See* East Africa Campaign.

Juba II (c. 50 B.C.-A.D. 20). A king of Mauretania. The son of Juba I, king of Numidia, who shared the defeat of the Pompeians at Thapsus and committed suicide in 46 B.C., he was brought to Rome as a child by Julius Caesar. When he grew up he gained the favour of Augustus, who in 30 B.C. restored to him his father's kingdom of Numidia, afterwards exchanged for Mauretania, when the former was made a Roman province. Fragments of his writings on history and geography remain.

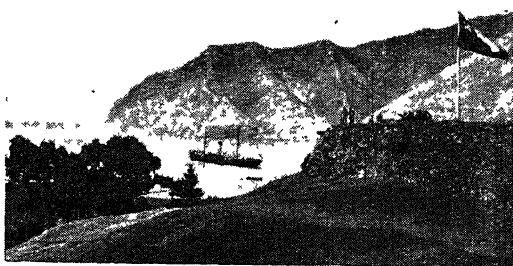
Jubal. Son of Lamech and Adah. He is traditionally the inventor of musical instruments (Gen. 4).

Jubaland. Region of E. Africa. It extends across the borders of Somaliland and Kenya, and is bounded S.E. by the Indian Ocean and on the S.W. by Tanaland. It is a tract of country varying from 50 m. to 100 m. in width, on the right bank of the Juba river, with an area of 33,000 sq. m. The capital is Kismayu, a port near the mouth of the river. Formerly altogether in Kenya, most of Jubaland was ceded to Italy by Great Britain in 1925. During the E. Africa campaign of 1941, British troops advanced into Jubaland, entering Kismayu on Feb. 14.

Jubbulpore. Division and city of India, in the Madhya union. The city is situated in a district of great natural beauty on the Nerbada. It stands at the junction of the Great India Peninsular rly. from Bombay and the East Indian rly. from Allahabad, and is one of the chief rly. centres in India. The college is affiliated to the



Benito Juarez



Juan Fernandez. Rocky entrance to Cumberland Bay Mas-a-tierra, one of this Pacific island group

university of Allahabad. There are a military cantonment and cotton and flour mills. The area of the division is 25,731 sq. m., about half being under cultivation, wheat the chief crop. Pop. of div., 3,691,112; city, 178,339.

Jubilate Deo. Latin title of a canticle in the Book of Common Prayer, being the opening words of Psalm 100, O be joyful in the Lord. It is given as an occasional alternative to the Benedictus, Blessed be the Lord God of Israel, and was added in 1552. Anciently it was sung in the Service of Lauds. See Psalms.

Jubilee (Heb. *jobel* or *yobel*, a ram's horn trumpet). Jewish festival celebrated during every 50th year before the Babylonian Captivity. Held in celebration of the release from Egyptian bondage, it was proclaimed by the sound of trumpets, and began on the day of Atonement (*q.v.*). During the year of jubilee the land was allowed to lie fallow, slaves were set free, all property reverted to its original owners or their descendants, and everyone returned to his family. Exception was made in the case of property within a walled city.

A jubilee (or holy year) was instituted by Boniface VIII, who granted on Feb. 22, 1300, and for each 100th year to come, full pardon to all who repented, confessed, and visited the churches of S. Peter and S. Paul 30 times if Romans, 15 times if foreigners. It is said that 200,000 people availed themselves of this indulgence in the year named. The jubilee was altered in 1343 to every 50th year, and a million pilgrims are stated to have visited Rome in 1350. The cycle was reduced to 33 in 1389 and to 25 in 1470. It lasts in Rome from Christmas to Christmas, and is extended in the following year to the rest of the Church. Extraordinary jubilees are subject to the will of the pope. The conditions have been modified, also the cycles.

The term jubilee is used generally to define the 50th anniversary of any noteworthy event. A 60th anniversary is known as a diamond jubilee. The term silver jubilee was popularised by the festival which, on May 6, 1935, marked the 25th anniversary of King George V's accession.

Jubilees, THE BOOK OF. One of the non-canonical O.T. Apocrypha or Pseudepigrapha, works written under an assumed name. It was written originally in Hebrew by a Pharisee, probably between 135 and 105 B.C. The

work purports to have come from the mouth of "the angel of the face" who talked with Moses on Mount Sinai, and is called the Book of Jubilees because the writer divides the period of history with which he is concerned (the Creation to the publication of the Law on Sinai) into jubilees. The book has been called also "little Genesis," not in the sense of an abridgment of Genesis, but meaning a lesser Genesis. The theme is the eternal validity of the Law.

Jubilee Singers. A body of emancipated negroes, male and female, which travelled round the world singing old negro hymns to raise funds for Fisk university, Nashville, Tenn. The company left Nashville in 1871 for a preliminary American tour and met with immense difficulties, as, owing to their colour, they were refused admittance to many hotels. They sang at leading churches in London, and then toured England, Scotland, and Wales. In 1875 they paid a second visit to England, and afterwards travelled on the Continent. In 1882 the choir was reorganized, and started on another tour, which included Great Britain and Ireland, Australia, New Zealand, Ceylon, India, China, and Japan. At Agra they had the unique experience of singing Christian hymns inside the Taj Mahal. Altogether they raised about £50,000.

Jubilee Trust. This is noticed as King George's Jubilee Trust.

Jucar (anc. *Sucro*). A river of Spain. Rising on the W. slope of the Sierra de Albarracin, in the prov. of Cuenca, it flows S. and E. into the Mediterranean at Cullera, 25 m. S. of Valencia. In length 300 m., it is connected with Albacete by canal. It drains an area of 7,620 sq. m.

Judah. The fourth son of Jacob and Leah. The misconduct of his three elder brothers, Reuben, Simeon, and Levi, resulted in his taking precedence over them, and being regarded in a sense as the future head of the family. Jacob's prediction of his supremacy started the long feud which separated Judah and Israel. He died during the sojourn in Egypt.

The tribe of Judah became the most important of the twelve, and from it sprang the house of David. It settled in S. Palestine, after the land had been conquered by Joshua and Caleb, with Hebron as the capital. David united the clans and gave the tribe its pre-eminence when Jerusalem became the capital. See Jews.

Judaizer. Name applied to a section of the early Christians who wished to retain the laws and practices of the Jews. The division arose in the days of the Apostles, when many of the Christians at Jerusalem condemned S. Peter for eating with Gentiles. The Pauline Epistles contain many arguments against the Judaizing elements in the Church; and indeed the Apostle's whole career was one long conflict with them. The Church at Jerusalem long maintained an attitude of opposition to the Gentile Churches; and the Asiatic Churches generally reckoned the date of Easter according to Jewish calculation.

Judas. One of the disciples of Christ, distinguished as "not Iscariot." Only once mentioned in the Gospels (John 14), he is generally supposed to have been the person otherwise called Thaddaeus or Lebbaeus (Matt. 10). It is possible that the Judas, son or brother of James, mentioned in Luke 6, was the same man.

Judas THE GALILEAN. Leader of a revolt against the Romans in Judea. The census of the Jewish people taken by order of Augustus during the governorship of Quirinius was bitterly resented, chiefly on religious grounds. Judas, a native of Gamala in Gualanitis, assisted by a Pharisee named Zadok, organized a rising which was vigorously suppressed, Judas himself being slain, and his supporters dispersed. The account in Acts 5 differs from that of Josephus (Ant. 18, v. 1), who does not mention the death of Judas. The date of the census is variously given as 4-3 B.C., or A.D. 6-9.

Judas Iscariot. One of the Apostles of Christ, who afterwards betrayed Him to the priests. He was the only Judean of the twelve, all the others being Galileans. As he was the treasurer and business man of the company, it is clear that he was regarded as a man of ability and integrity. He accepted a bribe of thirty pieces of silver to betray Christ, who at the Last Supper foretold that Judas would betray Him; but he subsequently returned the money and hanged himself in a fit of remorse. Attempts have been made to explain his conduct as a mere test of Christ to make Him declare His power.

Judas Maccabaeus (d. 101 B.C.). Jewish warrior. The eldest son of the priest Mattathias, he was his successor in the leadership of the Jews against Antiochus Epiphanes about 166 B.C. He won several victories over the Syrian

generals, and set up his headquarters at Jerusalem. He repaired and fortified the Temple, had it dedicated anew, and established a regular service of priests. He gained complete religious freedom for the Jews, but his attempt to secure national independence failed. Demetrius Soter sent an army to Jerusalem to instal a new high priest, and Judas had to retire with his followers. In 161 he won the battle of Adasa and entered into a treaty of alliance with Rome. But it was too late; Demetrius had invaded Judea with an army under Bacchides, and the Jews were routed at Elasa, where Judas was slain. By his victories and his piety alike he has become a Jewish hero. See Jews; Maccabees.

Judas Maccabeus. Oratorio composed by Handel. Set to words by Morell, it was begun in July, and completed in Aug., 1746, and produced at Covent Garden, 1747. Written in commemoration of Cumberland's victory at Culloden, it contains the chorus, See, the Conquering Hero Comes, and the tenor aria, Sound an Alarm.

Judas Tree (*Cercis siliquastrum*). Small tree of the family Leguminosae. It is a native of South Europe. It grows to a height of 20 ft. or 30 ft. and has polished, heart-shaped leaves. The flowers, which appear before the leaves, are pea-like, bright purple, and so abundant that the branches are hidden. It is so called from the legend that it is the tree on which Judas Iscariot hanged himself.

Jude, THE EPISTLE OF. One of the N.T. epistles. It belongs to the group known as the "Catholic Epistles," being apparently addressed not to particular communities, but to Christians in general. The author describes himself as a "servant of Jesus Christ" and "brother of James." If he is the Jude or Judas of Matt. 13, "one of the brethren of the Lord," the epistle must have been composed between about A.D. 60 and 70. The false teaching denounced in the epistle has indeed been taken to be some kind of antinomian Gnosticism, with the result that it has had to be assigned to another Jude, and to a later date. But the false teaching may well have been only one of the precursors of Gnosticism. The writer makes use of the apocryphal Assumption of Moses and the Book of Enoch. The resemblances between the Epistle of Jude and the Second Epistle of Peter are so close that one must have borrowed from the

other, or both must have made use of a common source.

Judea. District comprising the S. part of Palestine in post-exilic days. When the Jews returned from the Babylonian captivity, they settled here, and as they were mainly of the tribe of Judah they named their district Judea. The term sometimes means W. Palestine generally. See Jews; Judah; Palestine.

Jude the Obscure. A novel by Thomas Hardy. Published in 1896, this study of complicated questions of sex marked the final phase of Hardy's career as a novelist. Its appearance provoked so great a storm of abuse that its author declared that he would write no more works of fiction—though he did write *The Well-Beloved*. As in his *Tess of the d'Urbervilles*, his purpose was to show the passions of individuals in conflict with society, a theme he was to elaborate in his epic play, *The Dynasts* (q.v.).

Judge (Lat. *judex*). Civil officer appointed by the crown and invested with the executive power of

the law to hear and determine criminal and civil causes in properly established courts and to administer justice. The function of judges is to interpret the law as distinct from its enactment, a constitutional point of vital importance. Judges are still, as of old, nominated by the crown, but the Act of Settlement provided that



Judge of English High Court, in robes

they should not be removable at the pleasure of the crown but only on the address of both houses of parliament for misbehaviour, otherwise holding appointment for life.

Judges of the king's bench division of the high court preside at the assizes, which are circuit courts of the high court of justice. Qualification for appointment as a judge of the high court is ten years' standing at the bar, and for a judge of the court of appeal 15 years' standing at the bar, or being already a judge of the high court.

Puisne judges of the high court are officially styled Mr. Justice—

and addressed as My Lord. Fifteen years' service or disability by permanent infirmity entitles them to a pension. Judges are immune from action against them for anything said or done by them in their official capacity. They may not officiate in actions in which they have any personal interest, and they are debarred from sitting in parliament. In the county courts the judges are barristers of at least seven years' standing, appointed by the lord chancellor. They are styled Judge—and addressed as Your Honour. In Scotland the judges of the court of session are also known as senators of the college of justice and the lords of council and session. All the judges bear the title Lord. The judges of the outer house who hear cases at first instance are lords ordinary. In Scotland and England, the house of lords is the final court of appeal from the decision of judges in all civil matters. (See Assizes; Chancery; High Court; Judicature Acts; King's Bench; Session, Court of; Supreme Court.)

In Jewish history the rulers of the people before the establishment of the monarchy were called judges. Individually they owed their position primarily to force of personality, appearing under divine Providence as leaders and rulers in times of national emergency to free the people from oppression and distress into which they had been brought by their disobedience to the will of Jehovah. Judges existed in the Jewish theocratic system for about 450 years until the election of Saul as king, 1095 B.C.

Judge Advocate General. An official appointed by letters patent under the great seal to advise the crown on matters of military law, and especially in relation to courts-martial. The office dates back to the 17th century and was political until 1892 when it became non-political. It was held by the president of the probate, divorce, and admiralty division until 1905; since then by a permanent official under the secretary of state for War. A deputy judge advocate acts under the hand and seal of the judge advocate general. For the British navy the functions of the judge advocate general are performed by an official called counsel and judge advocate of the fleet.

Judge advocates attend at all courts-martial to provide accommodation for the court, frame the charges, summon witnesses, administer the oath to members of the court and to the witnesses,

advise both sides on points of law, watch the prisoner's interests, record the proceedings, and transmit these to the judge advocate general.

In the U.S.A. the judge advocate general's department is a bureau of military justice, keeps records of all courts-martial, has the custody of title deeds of lands belonging to the war department, undertakes the prosecution in military trials, and represents the government in the civil courts in cases affecting the army.

Judgement. In law, the decision of a court. The term is also often used for the actual delivery of a sentence. Judgements are divided into two classes, interlocutory and final. The former is delivered in the course of some cause upon some plea, e.g. an injunction or mandamus, while the latter, as far as the particular court is concerned, settles the action before the court. The judgement of English, Scottish, or N. Irish courts may be enforced in the other two countries by proper registration; and provision has been made for reciprocal enforcement of judgements with parts of the Empire and some foreign countries. *See* Doom; Last Judgement; Sentence.

Judgement. Statement of the relation between two objects expressed in a proposition, consisting of subject, predicate, and copula. They may be universal or particular; affirmative or negative; necessary or contingent; categorical, hypothetical, or disjunctive; analytic or synthetic. *See* Synthesis.

Judgement Debtor. In English law, anyone against whom judgement has been given for a sum of money. The person in whose favour the judgement is given is called the judgement creditor.

Judgement Summons. Summons taken out by a judgement creditor against a judgement debtor who has, or is supposed to have, the means to pay, but refuses to do so. The judge is asked to make an order for payment, either at once or by instalments; and this he does on proof of means. The judge can further order that, if the debtor does not pay as ordered, he shall be committed to prison. Though in English law there is no imprisonment for debt, debtors are thus sometimes imprisoned.

Judges, THE BOOK OF. Book of the O.T. It is so called because it recounts the history of the Israelite tribal chieftains who led the people in peace and war from the time of the settlement in Canaan under Joshua until that of the birth of

the prophet Samuel. The Hebrew term (*shōfetim*) corresponds to that used by Livy (*suffetes*) to describe the rulers of Carthage. The judges were warriors rather than judicial functionaries.

The book falls into four sections: (1) an introduction describing the state of Canaan at the beginning of the period of the judges, (1, 1-2, 5); (2) a moralising prelude to the history, (2, 6-3, 6); (3) the history of the judges, or what has been described as the real kernel of the history, (3, 7-16, 31); and (4) an appendix describing some special episodes (17-22). The first section contains an account of the conquest of Canaan which is parallel with the account given in the book of Joshua, but rests upon a somewhat different and divergent tradition. The third section contains notices of the following chieftains: Othniel (3, 7-11,) Ehud (3, 12-39,) Shamgar (3, 31), Barak and Deborah (4-5), Gideon (6, 1-8, 32), Abimelech (8, 33-9, 57), Tola (10, 1-2), Jair (10, 3-5), Jephthah (10, 6-12, 7), Ibzan (12, 8-10), Elon (12, 11-12), Abdon (12, 13-15), and Samson (13-16).

The book of Judges seems to represent a gradual growth, but much of it was probably compiled, with the help of older literary sources, in the 7th century B.C. *See* Bible; Criticism, Biblical; Old Testament.

Judicature Acts. Statutes concerned with the constitution of the English superior courts of law. The principal Act is that of 1873, by which the old courts of chancery, king's bench, common pleas, and exchequer, with the court of probate, the divorce court, and the court of admiralty, were all amalgamated into the high court of justice, in three divisions, viz. chancery, king's bench, and probate, divorce, and admiralty.

Every judge of the high court has power to hear any cause, e.g. there is nothing to prevent a judge of the chancery division from hearing an action at common law, or a judge of the king's bench division from trying a chancery suit, or either of them from hearing a divorce case.

Before the Judicature Acts the courts were so many watertight compartments; an action for breach of trust could be brought only in the court of chancery, an action for damages for negligence only in a court of common law. By the Judicature Act, 1873, common law and equity (chancery law) are to be administered concurrently; and where the rules conflict, equity is to prevail. This

Act provides one court of appeal from all divisions of the high court. The Judicature Act, 1925, consolidated earlier Acts. *See* Chancery; High Court; King's Bench.

Judicial Committee. Committee of the privy council constituted in 1833. It is the final court of appeal from all courts of the British Commonwealth outside the United Kingdom, i.e. from the dominions (with certain exceptions), the colonies, the Channel Islands, and the Isle of Man. Its jurisdiction has been considerably reduced since the Statute of Westminster, 1931, enabled any dominion to abolish the right of appeal to the committee from its courts. The right of appeal was abolished in Eire (1933), Canada in criminal cases (1933) and civil cases (1949), India and Pakistan (1950). From the Union of South Africa there has never been any right of appeal except with special leave, which has rarely been granted. The committee also hears appeals from English and Commonwealth prize courts, and from English ecclesiastical courts.

The members of the committee are the president of the council, the lord keeper or first lord commissioner of the great seal, and privy councillors who have held these offices or high judicial office in the United Kingdom, dominions, or colonies. Two privy councillors without any of these qualifications, and two persons with some special qualification, e.g. a particular knowledge of the law of some dominion, may also be appointed; in ecclesiastical cases archbishops and bishops may sit as assessors. In practice much of the work is carried out by the lords of appeal in ordinary. Appeals are usually heard by three members. The members meet in a room in Downing Street, without robes. After hearing a case they deliberate in private, and one of their number delivers the opinion of the committee, stating, with reasons, that it will advise His Majesty to allow or disallow the appeal. When a decision is by a majority, this fact is not disclosed.

The committee also decides constitutional questions affecting Northern Ireland, adjudicates on objections to schemes for endowed schools, and has power to compel a copyright owner to permit the reproduction of his works. *See* Appeal, Court of; Privy Council.

Judicial Factor. Term in Scots law meaning a person appointed by the court to manage property

the owner of which is for some reason unable to manage it. Thus a judicial factor may be appointed on the estate of an insane person.

Judicial Separation. In English matrimonial law, a decree of the court in the nature of a limited divorce. The marriage is not dissolved; but the parties are released from the obligation to live together. It used to be called divorce *a mensa et thoro*, from table and bed. See Divorce; Husband and Wife.

Judiciary. A name given to the judicial system of a country as a whole. See Judge; Law.

Judith. Anglo-Saxon poem of unknown authorship, ascribed variously to dates from the 8th to the 10th centuries, in alliterative verse. Only fragments of it remain. Its theme is taken from the book of Judith in the Apocrypha. There is an edition with translation by A. S. Cook, 1904.

Judith, THE BOOK OF. One of the O.T. apocrypha. It was written originally in Hebrew towards the end of the 2nd century B.C. It is a kind of religious romance recounting the adventures of a pious and patriotic Jewess, Judith, at the time of the return from the Captivity. Holofernes is sent by Nebuchadrezzar, the king of the Assyrians, to march against Palestine. In his attack on Jerusalem, he lays siege to the fortress of Bethulia. Judith, to save Jerusalem, visits the camp of Holofernes and captivates him by her beauty. Inviting the general to a banquet, she cuts off his head when he is in a drunken sleep and carries it back to Bethulia. See Apocrypha.

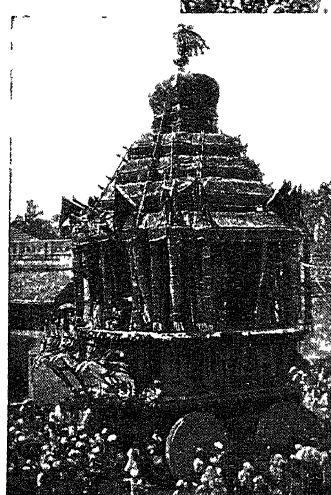
Judo. Alternative but less familiar name for jujitsu (*q.v.*).

Jug. Vessel for holding liquid. The derivation of the name is uncertain, one theory being that it comes from Joan or Jenny. Jugs are made of earthenware or glass, sometimes of metal, and have usually a single handle. They are of great antiquity, and the great collections contain remarkable specimens dating from early times. To jug is to cook by putting the food into a jug and placing this in boiling water, *e.g.* jugged hare. See Pottery.

Jugend, DIE. A Munich illustrated weekly devoted to art, *belles lettres*, and satire, founded 1896 by Georg Hirth, and first edited by Fritz von Ostini. With contributions not only from cartoonists and caricaturists, but frequently from outstanding painters, and with short stories or satires by

the best pens, it guided taste in design and ornamentation in arts, crafts, furniture, etc. The weekly fell victim to the Nazi suppression of criticism.

Juggernaut OR JAGANNATH (Skt. *Jagannatha*, Lord of the World). Name of a Hindu idol. It is kept in a temple dedicated to Vishnu or Krishna, at Juggernaut or Puri, in Orissa, anciently a sacred city of the Buddhists. On the most important of the many festivals in honour of the god, the figure is dragged on a colossal car,



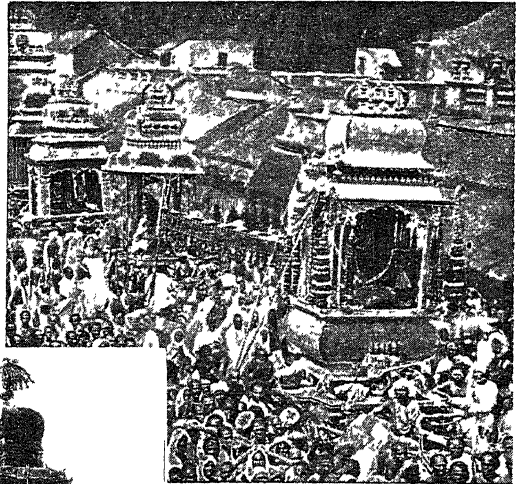
Juggernaut. Processional car, 50 ft. high, with solid wooden wheels 7 ft. in diameter and over a foot thick. Top, procession of cars bearing kindred deities dragged by devotees

first by devotees, and then by professional car-pullers, about a mile from its special temple and back again. Owing to the nature of the ground and the weight of the car, this task occupies several days. The ceremony is regarded as symbolic of the active world over which the god presides.

According to Sir W. W. Hunter's work on Orissa, 1872, the idea that the festival is specially associated with self-immolation is erroneous. In the press of devotees accidents are all but inevitable; but instances of pilgrims throwing themselves under the wheels in a frenzy of religious excitement are rare, though the occasion may now and then be taken advantage of by

would-be suicides. The error has given rise to the use of the term Juggernaut for any institution by which people or things are or may be crushed out of existence.

Juggling (Lat. *joculator*, jester). Term originally covering the activities of strolling minstrels, itiner-



ant acrobats, mimes, and sleight-of-hand performers. It is now generally understood to signify the manipulating and balancing of balls, knives, glasses, and other implements, involving pure skill on the part of the operator; as opposed to the tricks andlegerdemain of the conjurer, whose ability lies in deception. See Conjuring.

Juglandaceae. A family of trees. They are natives chiefly of N. America, although the walnut *Juglans regia* is a native of Asia. They have large, alternate leaves, divided into large, paired leaflets. The male flowers are in long catkins, the females in clusters. The fruit is a large, fleshy green husk enclosing a thin, woody shell which contains the large, coarsely wrinkled seed. The walnut is a good example of the fruit. The order includes hickories. See Hickory; Walnut.

Jugoslavia. This country of the Balkans is spelt Yugoslavia (*q.v.*) throughout this work.

Jugular Vein. Name given to the large vein in the side of the neck. See Anatomy; Man; Neck.

Jugurtha (d. 104 B.C.). King of Numidia. His uncle Micipsa having left his kingdom to be divided equally between his two sons, Hiempsal and Adherbal, Jugurtha murdered the former, and when the latter appealed to Rome for support bribed the senate to decree that he should have the western

half of the country. Defeating Adherbal at Cirta and putting him to death in 111, Jugurtha became sole ruler, and, largely by bribery, defied the power of Rome until he was defeated by Metellus and finally crushed by Marius, 106. Brought to Rome as a prisoner, Jugurtha was starved to death in the Capitol. His life and campaigns were the subject of a work by Sallust (*q.v.*).

Juin, ALPHONSE PIERRE (b. 1888). A French soldier. He was born at Bône, Algeria, and educated at St. Cyr. After serving in the First Great War he became chief of staff to Marshal Lyautey. Commander of a division during operations in N. France, 1940, he was taken prisoner by the Germans, released in 1941, and appointed c.-in.-c. Vichy French forces in N. Africa. When Allied forces landed there in 1942, Juin surrendered Algiers after a brief show of resistance and concluded an armistice with the Allies. After Darlan's assassination Gen. Giraud nominated Juin to lead French forces in N. Africa. In 1944 he became chief of the general staff for national defence, and accompanied Gen. de Gaulle to Moscow for a conference. He was made c.-in.-c. N. Africa, 1948.

Juiz de Fora. Town of Brazil, in the state of Minas Geraes. Formerly known as Parahybuna, it is 54 m. by rly. S.E. of Barbacera, and 170 m. N. of Rio de Janeiro. It has textile and meat packing establishments. The third largest manufacturing town in Brazil, it has a pop. of 85,000. The surrounding district yields coffee, sugar, and tobacco.

Jujitsu, JU-JUTSU, OR JUDO. The Japanese art of self-defence. Literally it means the soft way or gentle art, the two delicate qualities of leverage and balance being pitted against the rougher ones of strength and force. A Japanese dictionary says it was invented by the Chinese as an instrument of torture, and improved upon by the Japanese for self-defence and physical training over 2,000 years ago. It was practised by the Samurai for centuries, and until the accession of the mikado no one outside this caste was initiated into its secrets.

Jujitsu was introduced into England about 1900. Public demonstrations were given on the London music halls by two Japanese exponents, one of whom, Raku Uyenishi, opened a school in Golden Square, where he soon had a large clientèle. The other,

Yukio Tani, continued on the London and provincial halls for some years.

By jujitsu the weak can overcome the strong by the scientific use of leverage and balance, much as heavy weights and obstacles can be controlled by a lever operated upon by a man who without it would have no power upon them. Leverage is applied to the assailant's limbs, which can be broken with less than average strength. The joints are really dislocated by the laceration of the ligaments and the muscles torn from their origins and insertions by over-extension and twisting, the limbs being forced into unnatural positions, called locks, to which there is no key; the victim or assailant must give in to the conqueror or have the limb broken.

The neck, body, and hip joints are also attacked. The neck may be broken by leverage or a twist. The spine can be injured, the kidneys compressed, and the hips dislocated. The nerves and arteries can be operated upon. Pressure of the nerves against the bones causes great pain and a feeling of numbness akin to that sensation known as pins and needles, and limbs going to sleep. Arteries are knocked or pressed, and unconsciousness can be produced.

Jujitsu locks can be applied either in a standing position or when prone on the ground. The expert uses strategy when defending himself and manoeuvring for a lock. He will give way to his assailant momentarily the better to obtain the victory. He will feint at a standing lock, take his assailant off his guard and throw him, or will feint at a throw and then get a standing lock. He will suddenly throw his handkerchief or his cap at his opponent's face and temporarily obscure his vision, then secure a lock or a throw before his aggressor recovers.

Varieties of Throw

The throws in jujitsu are very violent, the intent being to throw on the head, shoulder, or spine. Sometimes the legs are swept away; or support is taken away by leverage on the body. When an attack is made, the expert will retreat and give way, then, as the assailant advances and brings forward his leg, will tap it with the sole of his foot at the knee or ankle and cause a trip. The throws by leverage on the body are effected with the thighs, hips, and shoulders. One of the most violent throws is the "stomach throw." This is brought about when the

supposed victim has been seized by the throat and forced back. He gives way, making a step or two backward; then, suddenly placing the sole of one foot against his attacker's stomach, immediately sits down on his haunches, pulling at the lapels of the other's coat, which he grasped on raising his foot, rolls back on to his shoulder blades, and levers his adversary right over his head to the ground. In doing the trips and throws the jujutsuan makes good use of his opponent's coat collar, lapels, and sleeves, and while his assailant's legs are going up, jerks his head or shoulder joint violently to the ground.

Technique of the Breakfall

A jujitsu expert never gets hurt in falling or being thrown. He has practised the breakfall, a valuable branch of jujitsu. Its object is to save falling, or being thrown, on a joint or on the head. If the arm is straightened quickly and the palm of the hand struck on the ground with good force a fraction of a second before the body touches, there is no shock. When being thrown heels over head, the chin is tucked in to the chest, and the hands and soles of the feet come to the ground first, quickly followed by the shoulders, the spine being kept up from the ground. When falling, or being thrown, straight forward on to the face, the body and legs are kept straight and the head in a line with the muscles of the neck tensed, and the ground is struck with the palms of the hands and the forearms, the arms being bent in the act of falling. The breakfall needs practice, but will be found invaluable in other spheres of life for self-defence. It has been used on the football field to escape a broken or badly sprained wrist, ankle, or knee joint. More than one hunter has thus avoided a dislocated shoulder or broken collar bone when thrown from his horse.

Jujitsu can be practised and used as a means of self-defence or as a sport without serious injury. When a throw is made it can be greatly modified in violence by holding up the coat just before the person thrown reaches the ground. The falls can be taken without risk of injury, and the locks can be applied to a nicety, so as to hold an opponent powerless with a minimum of pain sufficient to make him realize his helplessness. A bout is always won by a lock, the loser knowing when he is defeated and giving the signal himself by tapping his victor, or the

mat, or anywhere which proves to be the quickest, whereupon the victor immediately releases his opponent. *Consult* Judo: Thirty Lessons, T S Kuwashima, 1939.

Juju. Term used on the Guinea coast, especially in S. Nigeria, for local forms of fetishism. Although perhaps a native adaptation from the French *joujou* (plaything), as synonymous with fetish, it refers more usually to its magical power or medicine, or to the taboo-like ban which it imposes. Among the rites practised in jujuhuts human sacrifice is not unknown. *See* Cameroons; Fetishism.

Jujube (*Zizyphus*). Genus of shrubs and trees of the family Rhamnaceae. Natives of Asia and Africa, they have alternate, oval, and usually leathery leaves, and small greenish flowers. The fruits are fleshy, from $\frac{1}{2}$ in. to 1 in. in length, with a woody "stone" containing from one to four seeds. *Z. lotus*, now found wild all around the Mediterranean, is one of the fruits that are supposed to have afforded food to the lotus-eaters (Lotophagi) described by Herodotus and in Homer's *Odyssey*.

The common jujube (*Z. vulgaris*) was originally a native of China, but is now naturalised in W. Asia and S. Europe. It has twin prickles at the base of the leaves, and red or black, slightly acid, succulent fruit, the size of a cherry. The confectioners' jujubes derive their name from this fruit, once used in flavouring the sweet. The jujube-tree (*Z. jujuba*) is a native of India and Burma, and is now largely cultivated in China and other countries, affording an excellent dessert fruit.

Jujuy. Prov. of N.W. Argentina, on the frontier of Bolivia. Its area is 20,393 sq. m., with the addition of part of Los Andes in 1943. Mountainous, rising in the Cordillera Real to nearly 18,000 ft., it is watered by the Rio Grande de Jujuy. There are large forests and several salt lakes. It is rich in minerals—gold, silver, copper, lead, mercury, borax, antimony,

asphalt, and petroleum being found, but not extensively worked. Sugar, rice, fruit, wheat, and hides are among the chief products, while cattle and mules are reared. Pop. est. 127,549. Jujuy, the capital, founded in 1592, lies at an alt. of 4,035 ft., 950 m. N.W. of Buenos Aires. Sugar is refined, and there is a large transit trade with Bolivia.

Julia. Name of a patrician gens or clan of ancient Rome. Its ancestor was Ascanius (Iulus), the son of Aeneas, and its original home was Alba Longa. The most celebrated family belonging to it was that of the Caesars. It is also used as a feminine Christian name, Julius being the corresponding masculine form.

Julia (39 B.C.—A.D. 14). Daughter of the Roman emperor Augustus and wife of (1) M. Marcellus, her cousin; (2) M. Vipsanius Agrippa, (3) Tiberius, the future emperor. Her scandalous immoralities so distressed her father that he sent her into banishment. She is not to be confused with her equally immoral daughter by Agrippa, Julia (d. c. A.D. 28), the wife of Lucius Aemilius Paulus, whom Augustus also banished.

Julian (331–363). Roman emperor, 361–363, called the Apostate. His full name was Flavius Claudius Julianus. Born in Constantinople in 331, he was the nephew of Constantine the Great.

In a massacre of the imperial family Julian and his half-brother Gallus were the only two whose lives were spared. Brought up in seclusion, he early ceased to be a Christian, disgusted, probably, by the conduct of the nominally Christian Constantius; and at the university of Athens, he drank deeply of the old pagan literature and philosophy. In 355 Constantius gave Julian the title of Caesar and placed him in command of Gaul and the west, where he gained several brilliant victories over German tribes. Jealous of Julian's growing popularity, Constantius

called for the transfer of some of his legions to the east. The soldiers refused to go, and proclaimed Julian emperor. The death of Constantius in 361 left him master of the empire.

He proclaimed a policy of religious toleration, but discouraged Christianity by making it clear that the profession of paganism was the path to preferment. In 363 he set out on an expedition against the Persians. Penetrating too far into a waterless country, he was compelled to retreat, and in the last of a series of rearguard engagements received a mortal wound. The story that the wound was inflicted by one of Julian's Christian soldiers and that this drew from him the remark, "Thou hast conquered, O Galilean" lacks confirmation. Though fiercely assailed by Christian writers, Julian was a man of high character, and he even endeavoured, though without success, to graft on to the revived paganism the higher Christian morality. Of his works a number of letters, orations, and satirical writings survive. *Consult* Julian the Apostate, W. D. Simpson, 1930.

Juliana (b. 1909). Queen of the Netherlands. Juliana Louise Emma Marie Wilhelmina, princess

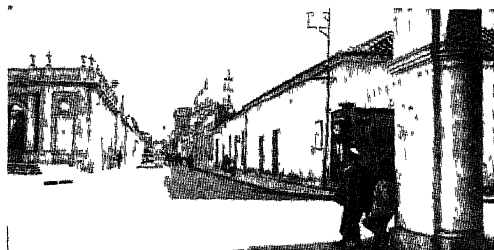
of Orange-Nassau, heiress to the throne of the Netherlands, was born at The Hague April 30, 1909, only child of Queen Wilhelmina and her consort, Henry, duke of Mecklenburg (d. 1934). She was educated at Leyden university. On Jan. 7, 1937, she married Prince Bernhard (*q.v.*) of Lippe-Biersterfeld. In May, 1940, the Germans made every effort to capture the royal family, but the queen, the princess and her husband and their two daughters Beatrix (b. 1938) and Irene (b. 1939) were brought to England by a British destroyer. The princess and the children went to Canada, where a third daughter, Margriet, was born in 1943. They returned to England on Sept. 10, 1944, and to liberated Dutch territory on May 3, 1945. A fourth daughter, Maria, was born 1947. In that year the princess acted as regent for her mother Oct. 14–Dec. 1; then on the latter's abdication in her favour, Sept. 4, 1948, succeeded to the throne.



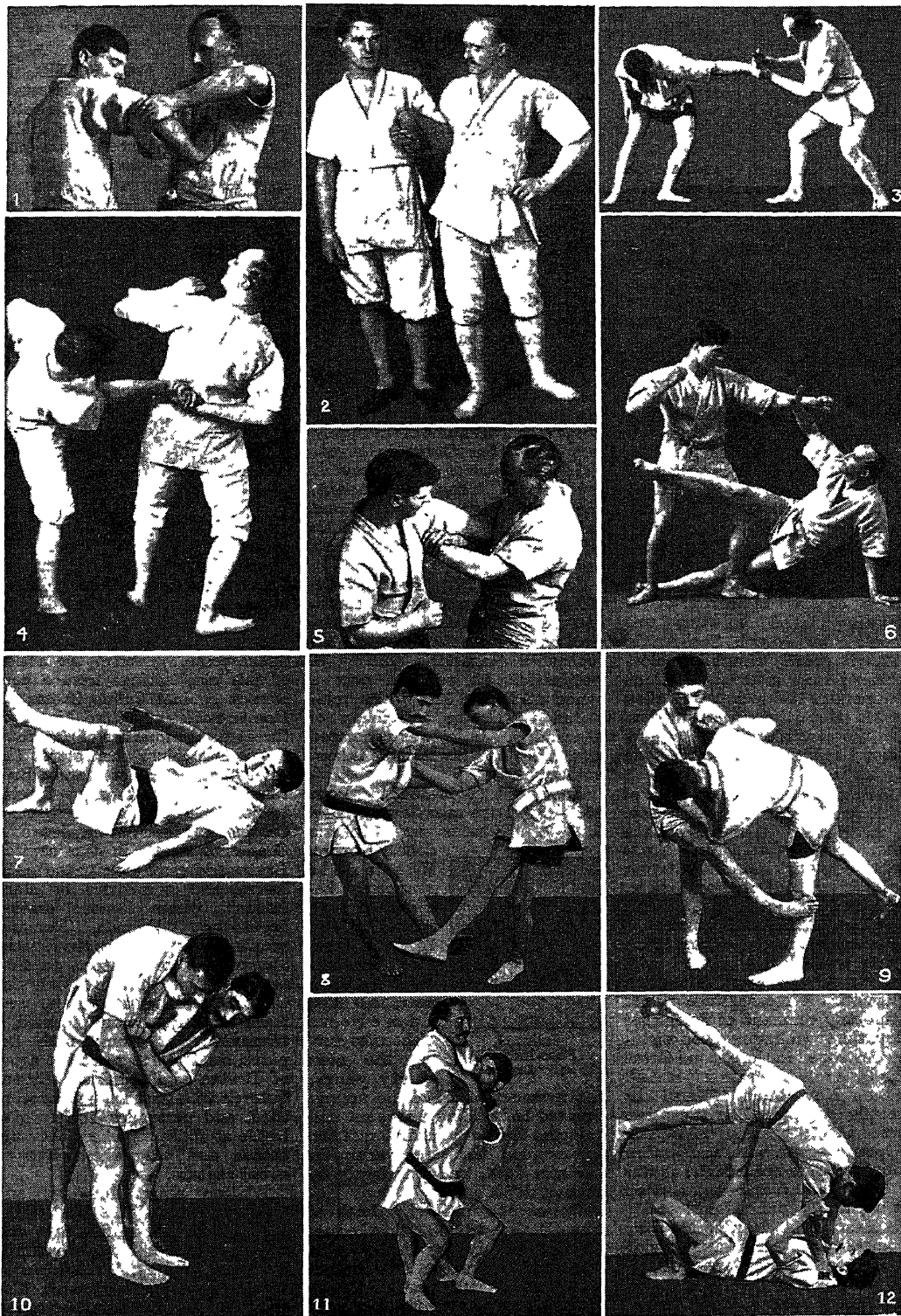
Queen Juliana of the Netherlands



Julian the Apostate, Roman emperor
From a bust



Jujuy, Argentina. Calle Belgrano, principal street in the capital of the province



1. Wrist lock defence against push on chest. 2. Wrist and elbow lock. 3. Forward wrist lock. 4. Outside wrist twist throw. 5. Standing straight arm lock. 6. Scissors throw. 7. Break fall. 8. Ankle throw made with left foot. 9. Knee throw. 10. Hip throw. 11. Shoulder throw. 12. Stomach throw

JUJITSU, OR JUDO: SOME LOCKS AND THROWS OF THIS METHOD OF SELF-DEFENCE

1-6 by courtesy of W. H. Garrud, 7-12, of Athletic Publications, Ltd.

Julian Alps (Lat. *Alpes Juliae*). S.E. extension of the E. Alps of Europe. Known sometimes as the Carniolan Alps, they stretch through Carniola into Yugoslavia. From the Carnic and Venetian Alps they extend between the Isonzo and Save rivers, S.W. towards the Karst. The loftiest peak is Mt. Terglou or the Triglav, alt. 9,395 ft. See Alps.

Julian Calendar. Introduced in 45 B.C. by Julius Caesar, who adopted a year of 365½ days by ordaining that every fourth year should contain a day more than the usual 365. It is now superseded by the Gregorian calendar, introduced into R.C. countries in 1582, England in 1752, and Russia in 1918. See Calendar.

Julian Period. Period of 7980 Julian years obtained by multiplying together the 15-year period of the Roman indiction, the Metonic cycle of 19 years, and the 28-year solar cycle. All these cycles are supposed to begin together on January 1, 4713 B.C., and a system of chronological reckoning based on this was proposed by Joseph Scaliger in 1582. It greatly simplifies calculation of long intervals of time. Astronomers still reckon by Julian Days in calculations where freedom from the confusion introduced by unequal months and years is an advantage.

Jülich or **JULIERS.** A town of N. Rhine-Westphalia, Germany, 15 m. N.E. of Aachen, on the Roer. In the Middle Ages it was capital of a duchy, and a fortress; in 1609, with Cleves and Berg, the object of a famous, almost international, conflict over the rights of succession; from 1815 it was part of Prussia. It goes back to the Roman settlement Juliacum. A Renaissance palace is the only remnant of its former glory, the town having been virtually destroyed in the Second Great War by an "obliteration" R.A.F. raid on Nov. 16, 1944, and the street fighting preceding its capture by the U.S. 9th army on Dec. 2. Its paper, sugar, wire, and leather industries were important; it was a rly. junction and had a good historical museum. See Cleves.

Julienne. A clear, spring soup flavoured with sorrel and having in it vegetables such as carrots and turnips cut into long strips. It is named after Julien, a French caterer of Boston, Mass.

Julier Pass or **COL DU JULIER.** Road pass of Switzerland, in the canton of Grisons. Opened in 1827, it connects Thusis with the Enga-

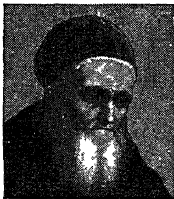
dine, and crosses the Rhaetian Alps at 7,500 ft. alt.

Juliet. Leading female character in Shakespeare's tragedy *Romeo and Juliet* (*q.v.*). The only daughter of Capulet, not quite 14 when the play begins, she falls in love with Romeo, the son of her father's enemy Montague. She is married to Romeo in secret, only to be quickly parted. Commanded by her parents to marry Paris, she drinks a potion and is laid as though dead in the family vault, where, having awakened and found Romeo dead from poison, she stabs herself to death with his dagger.

Julius. A masculine Christian name. It originated as a Greek word meaning downy bearded. At Rome it was the name of the family to which Julius Caesar belonged, and his association with it gave it popularity. Julius is a variant, and French forms are Jules and Julien. Feminine forms include Julie, Julia, Juliana, and Juliet. See Caesar.

Julius I (d. 352). Pope 337-52. The son of a Roman named Rusticus, he succeeded Marcus in the papacy. Appealed to by the Arians in Alexandria and by S. Athanasius, he presided over a synod at Rome, 340, which reinstated the latter as bishop of Alexandria. Julius was venerated as a saint, and his festival is kept on April 12.

Julius II (1443-1513). Pope 1503-13. Born near Savona, Dec. 5, 1443, his name was Giuliano della Rovere. His uncle Francesco became Pope Sixtus IV in 1471. Giuliano was made cardinal the same year, and held numerous bishoprics during the next thirty years,



Julius II,
Pope 1503-13
After Raphael

the revenues of which he mainly devoted to building fortresses and palaces. Soldier and diplomat, he commanded the papal army in Umbria, 1474, and was legate to France, 1480.

It was not until the death of Pius III, Oct. 18, 1503, that he succeeded, largely by bribery, in securing the papacy. As Julius II he at once made war on Cesare Borgia, and, joining the league of Cambrai, compelled Venice to restore papal territory in the Romagna. He then determined to drive the French out of Italy, and, aided by Venice and Spain, ac-

complished this in 1512. Julius died in Rome, Feb. 20, 1513. In the main a soldier, he re-established the papal states, and insisted on the reform of discipline within the Church at Rome. He was also the patron of Raphael and Michelangelo; the former's painting of him is celebrated. Consult History of the Papacy, M. Creighton, 1901.

Julius III (1487-1555). Pope 1550-55. Born at Rome, Sept. 10, 1487, the son of a jurist, his name was Giovanni del Monte. Archbishop of Siponto, 1512, he was papal legate in Italy, 1534, and cardinal, 1536. He presided at the opening of the council of Trent, 1545. As pope



Julius III,
Pope 1550-55
After Pulzone

he allied himself with the emperor Charles V against France, but was driven by the success of the latter to make peace, 1552. He died at Rome, March 23, 1555.

Julius Caesar. A tragedy by Shakespeare. Though the action of this play springs from a conspiracy against Julius Caesar by Roman nobles who think his power threatens the liberties of the state, Julius is a minor character. The chief part is that of Marcus Brutus, who is spurred on by Cassius to join the conspiracy. Brutus, Cassius, and their accomplices stab Caesar to death in the capitol. Brutus addresses the citizens in the forum, and is followed by Mark Antony, whose famous oration beginning, "Friends, Romans, countrymen," inflames the citizens against the conspirators, so that they flee from the city. Octavius Caesar, nephew of Julius, and Mark Antony, having formed a triumvirate at Rome with Lepidus, set forth to meet the army of Brutus and Cassius; Brutus quarrels with Cassius, but is reconciled, and persuades him to give battle at Philippi, where they are beaten and slay themselves to avoid capture.

Written about 1600-01, and first printed in the 1623 folio, Julius Caesar is in five acts and contains 2,440 lines, of which 165 are prose and 2,241 blank verse, with 34 pentametric rhymes. The scenes are laid in Rome, Sardis, and near Philippi; and the action covers six days with intervals. There were several previous plays in English and French on the same theme. For his groundwork Shakespeare

went to North's revised (1595) version of Plutarch's *Lives of Julius Caesar, Brutus, and Antony*.

There was a notable revival at Her Majesty's in 1898, with Beerbohm Tree as Antony and Lewis Waller as Brutus. Henry Ainley appeared as Antony and Basil Gill as Brutus at the St. James's Theatre, in 1920. Ralph Richardson was Brutus and Robert Speaight, Cassius, at the Old Vic., in 1932. At His Majesty's in 1939 the play was acted in modern dress.

Jullundur. A division, district, and town in East Punjab, India. Area of division, 19,394 sq. m.; of district, 1,431 sq. m. Three-quarters of the district is under cultivation, wheat being the chief crop. The industries include the manufacture of cotton goods. The dist. is one of the richest in the Punjab. Jullundur town has a few industries. Pop. of division, 5,438,581; dist., 1,127,190; town, 135,283.

July. The seventh month of the Christian calendar. In the old Roman calendar it was the fifth month and called originally Quinctilis. Mark Antony renamed it in honour of Julius Caesar, born in the month. The Anglo-Saxons called July Hey-monath, from the hay harvest, and also Maed-monath, from the meadows in bloom. In the U.K. this is on the average the warmest month. *See* Calendar.

July Plot. Name given to a German conspiracy to kill Hitler and rid Germany of the Nazis which came to a head in July, 1944. Dismissed at the time by Nazi propaganda as an unsuccessful plot by a small and uninfluential group, the July plot proved, on investigation of relevant documents which fell into Allied hands, to have been a widespread conspiracy with beginnings in 1938, involving men of many shades of opinion drawn from all walks of life. The wide diversity of men involved, and the stress of conflicting loyalties created by the outbreak and progress of war, contributed to the bungling of the conspiracy in its carrying out.

October, 1944, was fixed as the moment of revolt; but the acceleration in the pace of the war, including the Allied invasion of France in June and the growing weight of Allied air bombing attacks on Germany, led the conspirators to advance the date to July, with the result that action was in part improvised. The inner circle of conspirators consisted

almost exclusively of officers who belonged, or had belonged, to the German general staff. Highest in rank was F.-M. Erwin von Witzleben; others were Col.-Gen. Beck and Col.-Gen. Halder, both former chiefs of staff; Gen. Olbrecht, q.m.g.; and Col.-Gen. Fromm, c.-in-c. home army.

Olbrecht's a.d.c., Col. von Stauffenberg, on July 19 placed a time bomb intended to kill Hitler in the room of his h.q. on the eastern front, where he was to hold a conference next day. The conspirators had anticipated that this would be an underground room with concrete walls which would have resisted and driven back the blast, thus killing anyone near the explosion. In fact, the conference room proved to be a wooden hut whose walls collapsed. Hitler, at the moment of the explosion, had just left his chair, under which the bomb had been placed. He was merely bruised.

Stauffenberg had left the hut a few minutes before the explosion, hearing which he boarded an aeroplane for Berlin, certain that Hitler was dead. Through Fromm the conspirators were masters of the war ministry in the Bendlerstrasse. Fromm gave some of the orders necessary to secure Berlin and the main centres outside the capital. But suddenly he collapsed. Stauffenberg, being only a colonel, met with resistance when he attempted to take over. Beck tried to back him, but, because of long retirement, had little authority, and both were killed in an ensuing fight with revolvers.

Meanwhile in Hamburg, Munich, Vienna, and Paris the commanding officers had received and acted on Fromm's orders. State and party buildings were occupied, and in some places fierce fighting started between army and S.S. units. These movements collapsed immediately it was realized that Hitler was alive and the capital was once more under Nazi party control, except in Vienna and Paris, where high party and Gestapo officials were held under arrest until July 21.

Everywhere the opponents of the Nazis had revealed themselves, and the Nazis took their vengeance. They set up a "court of honour" under Rundstedt (suspected of being at least ready to work with the conspirators had they succeeded) which delivered all the accused officers to the "people's court," where they were tried publicly and quickly sentenced to hang. All other

potential enemies of the regime capable of exerting any influence were rounded up and killed without public trial. The names were found recorded of more than 4,980 Germans destroyed in this "purge," reason enough for the lack of German leadership in the reconstruction period after the war.

Jumbo. The popular name for an elephant. The original Jumbo was an African beast captured by Hamran Arabs, sold to the Jardin des Plantes, Paris, in 1861, and later acquired by the London zoo in exchange for a rhinoceros. In London he grew until he became the largest elephant in captivity and a favourite exhibit. In Jan., 1882, it was announced that Jumbo had been sold to P. T. Barnum, the American showman, for £2,000. The news caused a furore of popular indignation. Hundreds of letters appeared in the press, and among those who protested to the zoological society were the Queen, the prince of Wales, and John Ruskin. Questions were asked in Parliament; the Daily Telegraph cabled a plea to Barnum on behalf of all British children; James Russell Lowell, then U.S. ambassador, stated that Jumbo was "the only burning question between the two nations." Statements that Jumbo's temper had become uncertain were disbelieved, and a sentimental rumour that a female elephant, Alice, would pine for her lover gave rise to verses much quoted and sung at the time. Certain members of the zoological society brought an action in chancery for an injunction against Jumbo's removal, but the court upheld the society's right of disposal.

When Jumbo was shipped aboard the cargo steamer Assyrian Monarch, his nine-mile progress to the docks in a huge crate, followed by hundreds of admirers, was fully described in every newspaper, and at Gravesend the Baroness Burdett-Coutts brought a party aboard to give Jumbo his last London bun. He arrived at New York on April 9, thereafter becoming an attraction in Barnum and Bailey's circus for three years. While in Ontario, Jumbo was accidentally killed on the railway, Sept. 15, 1885. The skin was stuffed and presented by Barnum to Tuft's College, Mass.

Jumet. Town of Belgium, in the prov. of Hainaut. It lies in hilly country, is connected by rly. with Charleroi, 4 m. to the S., and has coal and metal industries and glass factories. Pop. 27,677.

Jumièges, ROBERT OF (d. c. 1077). Norman prelate. A monk, he became abbot of Jumièges, where he made the acquaintance of Edward the Confessor, and about 1042 settled in England, becoming one of the king's most influential advisers. He was made bishop of London in 1044 and in 1051 was forced into the archbishopric of Canterbury. However, he was never actually archbishop, for on the return from banishment of Godwin, the leader of the party opposed to the influence of Robert and the Normans, he fled to Normandy, where he died. He was outlawed, and his treatment was mentioned by William the Conqueror as a reason for invading England.

Jumilla, Town of Spain, in the prov. of Murcia. On the S. slope of a castle-crowned hill, 38 m. N.N.W. of Murcia, it possesses oil and corn mills. The 15th century church of S. James contains notable frescoes and paintings. There is trade in wine, oil, esparto, and cloth. It is connected by rly. with Alicante and Valencia. Pop. 20,340.

Jumna OR JAMNA. A river in N. India, the most important tributary of the Ganges. It rises in the Jumnotri glacier in the Kumaon section of the Himalayas. Below its junction with a mountain torrent, the Tons, it forms the boundary between the Punjab and the Uttar union; it then turns S.E. and, receiving the Chambal, Sind, Betwa, and Ken from the Vindhya Mts., flows within the Uttar union to join the Ganges at Allahabad after a course of 850 m. This junction is known as that of the three rivers—legend declaring that the third is the sacred underground river Saraswati. The Great Doab lies between the Jumna and Ganges.

The main stream is fed from the melting snows and the monsoon rains, and is loaded with silt. The right bank feeders flow in rocky channels, and are nearly dry in the hot, but flooded in the rainy, season. Irrigation canals take off much of the water. In addition to Delhi the chief towns on the banks are Agra and Muttra. See Allahabad.

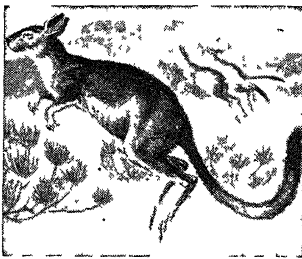
Jumping. Branch of athletics (*q.v.*). A principal feature at the Greek Olympic games, also in modern athletic meetings, the high and long jump are the most usual forms. Others are the pole vault, and the hop, step, and jump.

Jumping Bean.

Popular name for the seed of a number of resinous trees and herbaceous plants of Central and S. America. The seed is frequently infested by the larva of a moth, the movement of which during its transformation into the pupa causes the bean to roll from side to side, and occasionally to jump in short jerks. The seed is also known as Mexican bean, and (in the U.S.A.) as broncho bean.

Jumping Frog, THE. A short story by Mark Twain, which gave its title to his first volume, published in 1867. It is a drolly told anecdote of a man who made a bet on the jumping powers of The Celebrated Jumping Frog of Calaveras County, and of the trick by which the frog was made to lose.

Jumping Hare OR SPRING HAAS (*Pedetes capifer*). Species of rodent found in South Africa. It

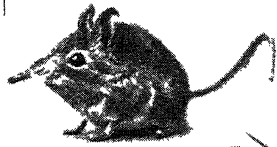


Jumping Hare. Specimen of the South African rodent

resembles a hare in size, colour, etc., but it has a long tail and kangaroo-like legs. Common in Cape Colony, where it lives among the hills, it is seldom found abroad in the daytime. It is able to take amazing leaps of 20 ft. to 30 ft.

Jumping Mouse (*Zapus hudsonius*). Small rodent, related to the jerboa but found in N. America. It resembles a mouse with very long hind legs, a long tail, and remarkable leaping powers. It lives in the woods and feeds upon leaves, seeds, and bark, hibernating in holes. See Jerboa.

Jumping Shrew (*Macroscelididae*). Family of shrews with long hind legs, rather resembling the jerboa. They belong to the order of insectivora, but are said to eat vegetable food as well as insects.



Jumping Shrew. Specimen of the rock elephant shrew
W S Berridge, F.Z.S.

There are numerous species, all found in Africa; some (elephant shrews) have long proboscis-like snouts. Living in burrows and crevices of the rocks, they are nocturnal in habit.

Junagadh. State of India, in the Kathiawar pen. About one-third is under cultivation, cotton, wheat, and millet being among the chief crops. It was formerly ruled by a nawab. Area, 3,337 sq. m.; pop. 670,719 (80 p.c. Hindus). Junagadh, the capital, lying on the Girnar and Datar hills, is of great archaeological interest. In the old citadel are Buddhist caves believed to have been used as a monastery. A famous Asoka inscription, one of the king's many rock edicts, is housed at the foot of Girnar hill, and to the S.E. lies the Gir forest, 495 sq. m., the only place where Indian lion can be found. Pop. 50,200.

Following the accession to Pakistan in Aug., 1947, of the Muslim nawab, Indian govt. troops entered the state to enforce a plebiscite, which resulted in a big majority for accession to India. In 1949 Junagadh was merged in Saurashtra.

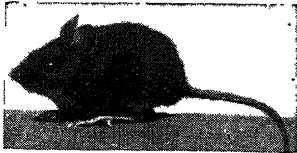
Juncaceae. Family of mostly perennial herbs (rushes). Natives of the temperate and Arctic regions, they have creeping rootstocks, and erect simple stems filled with thick white pith. The leaves are grass-like (*Luzula*), stem-like, or reduced to scale-like sheaths. The chaffy flowers are small, and brown or green in colour. The stems are used for plaiting into mats and baskets, or for chair-seats, and the pith of the rush serves for the wicks of rushlights.

Junction Box. In electricity, a box through which the main wires of an electric system pass, and where branch wires may be joined. See Electricity; Electric Power.

Juncus. Latin name for the genus of plants known as rush (*q.v.*).

Jundiahy. Town in the state of São Paulo, Brazil, reached by road or rly. (about 30 m. N.) from São Paulo. It is a centre of the textile industry, and makes matches and pottery. Pop. 30,000.

June. The sixth month of the Christian calendar. Several derivations have been suggested: (1) from the goddess Juno; (2) from Lat. *juniores*, referring either to the junior branch of the Roman legislature or to youth generally;



Jumping Mouse, native of the N. American woods

(3) from Junius Brutus, who was consul in this month. The Anglo-Saxons called June Sere-monath (dry month). The insurrection in 1848 of the Paris Socialists against Cavaignac is known as the June Days. *See* Calendar.

Juneau. Capital of the U.S. territory of Alaska. On Gastineau Channel, it lies opposite Douglas Island. It contains a six-storey capitol, customs house, assay office, churches, schools, hospitals, and banks. Gold mining and salmon canning are the chief industries; there are lumber interests; and wood pulp and newspaper are produced. Steamship services afford connexions with Seattle, Sitka, and other ports; air services maintain communication with the interior. Juneau was incorporated in 1900 and made the capital in 1906. Pop. 5,729.

June. Town in Clarendon co., New South Wales, Australia. It is 298 m. S.W. of Sydney on the main line to Melbourne, and is the junction for the Murrumbidgee valley line to Hay, head of navigation on the river. Pop. 4,370.

Jung, SIR BAHADUR (1816-77). Nepalese statesman. Of the chief family in Nepal and an officer in its army, he became prime minister in 1846. He held undisputed power for some 30 years, removing dangerous rivals at once by the so-called massacre of Kot, and filling subordinate posts with his own relatives. He introduced important legal and administrative reforms, and supported British rule. He was knighted in 1873. On his death, Feb. 25, 1877, he was succeeded by his brother, Sir Ranadip Singh Bahadur.

Jung, CARL GUSTAVE (b. 1875). Swiss psychologist. Born at Basel, July 26, 1875, he qualified as a doctor at the university and continued his studies in Paris. Specialising in psychology, he joined Freud (*q.v.*), of whom he became an enthusiastic disciple. He was physician at the psychiatric clinic at Zurich, 1900-09, and lecturer at the university, 1905-13. By 1911 Jung's writings and lectures had made it clear that he no longer accepted the full Freudian theory of psycho-analysis, and with Maeder he founded a new school. Rejecting Freud's

emphasis upon the universality of the sexual impulse in all psychological phenomena, he evolved a subtle theory whereby people were classified in two main types, introverts and extraverts. Each type was later modified into four subdivisions: thinking, feeling, sensation, and intuition.

Known as analytical psychology, Jung's theory was based upon specialised studies of cases of dementia praecox, and he made an important contribution to the understanding of that form of insanity. According to Jung, the primeval drive in mankind is not sex, but an *anima* originating in the collective racial inheritance. The unconscious becomes an undeveloped conscious, and the phenomena of dreams a reflection of the dreamer's type rather than of his suppressed desires. Dreams provide clues to the understanding of the patient's development, and aid the psychologist to effect an improvement by encouraging his particular creativeness. Later, Jung's system developed mystical aspects which defy any brief description. Jung's numerous publications include: *Psychology of Dementia Praecox*, 1906; *Psycho-Analysis*, 1912; *Psychology of the Unconscious*, 1916; *Analytical Psychology*, 1917; *Psychological Types*, 1923; *Modern Man in Search of a Soul*, 1933; *Integration of Personality*, 1939. *See* Psycho-analysis.

Jung, SIR SALAR (1829-83). An Indian statesman. Of distinguished family, he succeeded his uncle as prime minister of Hyderabad in 1853, and, with the nizamat Afzul-ud-Doula, played an important part in assuring the safety and integrity of Hyderabad in and after the Mutiny of 1857. He was later knighted. He visited England in 1876, and was made honorary D.C.L. of Oxford. He died at Hyderabad, Feb. 8, 1883.

Jungfrau (Ger., maiden). Mt. peak of Switzerland. On the boundary of the cantons of Berne and Valais, S.W. of the Monch and Eiger, it is a beautiful snow-clad peak of the Bernese Oberland. Surrounded by steep precipices, it has an alt. of 13,670 ft.

The peak was first ascended in 1811 by the brothers Meyer of Aarau; in 1828 by six Grindelwald mountaineers, and by many others since. The first ascent from the Interlaken side was made by Sir G. Young and the Rev. H. B. George in 1865. The ascent can be made by rly., by the Wengern Alp (rack-and-pinion) line to the Little

Scheideck, and thence by electric rly. via the Eiger glacier, the Eismeer, the saddle between the Jungfrau and the Monch, known as the Jungfrau-Joch, and the terminus (13,428 ft.), with lift to the summit. *See* Alps: Interlaken.

Jungle (Hind. *jangal*, waste land). Low-lying, wet land covered with forests and rendered almost impassable by dense undergrowth. Extremely unhealthy owing to the great heat and the presence of stagnant water, jungles are common in equatorial regions, on coastal plains, and at the foot of mt. ranges. Two examples are the Sundarbans, the delta of the Ganges-Brahmaputra, and the Terai, at the S. base of the Himalayas. They are the haunts of giant reptiles, tigers, elephants, monkeys, etc. and contain many climbing plants.

Jungle Books, THE. Two volumes, *The Jungle Book*, 1894, and *The Second Jungle Book*, 1895, by Rudyard Kipling. The chief tales introduce as leading characters the beasts of the Indian jungle, who for the purposes of narration are given voices and certain other human attributes. Also within the "Law of the Jungle" is the human boy Mowgli, reared by the Wolf Pack. But the volumes contain other animal stories which have no connexion with the Mowgli theme, e.g. Rikki-Tikki-Tavi, the story of a pet mongoose.

Jungle Fowl. Genus of wild birds belonging to the game-bird tribe. They are found in India and the E. Indies. There are several species, some of them closely resembling bantams in appearance. They are the source from which the breed of domestic fowls has been derived. *See* Biology illus.

Juniata. A river of Pennsylvania, U.S.A. Rising in the outlying spurs of the Allegheny Mts. it follows a sinuous N.E. and E. course of 140 m. to its junction with the Susquehanna above Harrisburg. It is one of the most picturesque of N. American rivers, but is unnavigable.

Junin. Dept. of Central Peru. It is traversed by a range of the Andes. Its area is 22,814 sq. m. Lake Junin, alt. 13,000 ft., is drained by the river Mantaro. The chief productions of the dept. are silver, copper, coal, salt, lead, vanadium, cereals, sugar, cacao, and coffee. The capital is Cerro de Pasco (*q.v.*). Pop. 428,855.

Junin. Name of three S. American towns. (1) In Argentina, in the prov. of Buenos Aires. It stands on the Rio Salado, 150 m. by rly. W.



Carl Jung.
Swiss psychologist

of Buenos Aires, and is an important rly. junction. Pop. 70,000. (2) In Peru, in the dept. of Junin, 98 m. N.E. of Lima, with which there is rly. connexion. (3) In Chile, in Tarapaca prov., 50 m. N. of Iquique, a port for the transshipment of nitrate.

Juniper (*Juniperus communis*). Evergreen shrub or small tree of the family Coniferae. It is a native of Europe, N. Africa, Asia, N. America, and the Arctic regions. Its form is bush-like, and its wood red, like that of the yew, its red-brown bark flaking off when old. The leaves are awl-shaped with sharp points. The cones are round, berry-like, with fleshy blue-black scales coated with grey, waxy "bloom." In their first year they remain hard and green, ripening the second year. The whole plant has a



Juniper. The common species whose fruit yields medicinal oil

strong odour of turpentine. A low, spreading form (*nana*) was formerly regarded as a distinct species. Juniper "berries" provide the flavouring for gin. *J. sabina* is the savin of S. Europe; *J. bermudiana* is the Bermuda cedar, which formerly supplied the wood for cedar-pencils.

Oil distilled from the ripe fruit of *Juniperus communis* was formerly in frequent use in medicine as a diuretic.

Junius, LETTERS OF. Series of letters on public affairs which appeared in The Public Advertiser, London, 1768-72. As revised by the writer—who signed himself Junius, a reminiscence of Lucius Junius Brutus (*q.v.*), and used other signatures—they were collected, dedicated to the nation, and published by Woodfall (*q.v.*), editor and printer of The Public Advertiser, in 1772, together with letters by Sir William Draper and other contributors to the correspondence. Editions issued in the 19th century included the private correspondence of Junius with Woodfall and John Wilkes, and a number of miscellaneous letters, attributed to Junius. The identity of Junius is still disputed; he is generally supposed to have been Sir Philip Francis (*q.v.*), though the names of Burke, Earl Temple, and many others have been hazarded.

Junius warned George III of the fate of Charles I, attacked the government, and flayed with bitter invective the dukes of Bedford and Grafton, Draper, and the lord chief justice Mansfield. He knew the inner working of war office and foreign office, was familiar with events at court, attended house of commons debates, and by turns defended and attacked the earl of Chatham. He successfully defied the law, and his printer, charged in connexion with the letter to George III, Dec. 19, 1769, was acquitted.

Junius created a great sensation, but modern criticism, while granting his gift for personal invective, power of conveying an impression of strength, love of country, disinterestedness, and knowledge in reserve, and the adroitness and Latinity of his antithetical style, regards the praise

bestowed upon the letters as a reflection of the time when rhetoric was over-valued, and Junius himself as a man full of malignant spite who devoted much talent to the service of party and self-gratification.

Junk (Fr. *jonque*, from Malay *ajong*, a boat). A flat-bottomed seagoing boat, peculiar to the Chinese, Japanese, and Malays. It has no prominent stem or keel, but a very high fore-castle and poop; the bow is square, and the rudder is suspended from the stern, travelling at greater depth than the bottom of the vessel. It carries large square sails of matting on lofty masts, which are in one piece. Although awkward to handle and very slow, a junk is exceptionally seaworthy. Junk is also a nautical term for old cordage and other obsolete gear; hence the common use of the word.

Junker (Ger. *jung*, young; *Herr*, gentleman). Term formerly applied to members of the land-

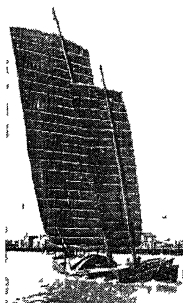
owning class of Prussia and N. Germany generally. This squirearchy long exercised great influence on the aristocratic and military life of Germany, but its power was modified by the revolution of 1918. The name was also given to the great merchant princes of the free city of Danzig, where it survives in the name of the exchange building, the Junkerhof. An English form was *yunker*, used in Elizabethan times for a gallant.

Junker, WILHELM JOHANN (1840-92). Russian explorer. Born of German parents at Moscow, April 6, 1840, he was educated at St. Petersburg and in Germany. During 1873-75 he travelled in Egypt and Tunis, and in 1876 explored the Blue Nile. He discovered the basins of the Welle in 1879, but as he was making his way homeward in 1883, the Mahdist disturbances obliged him to take refuge with Emin Pasha at Lado. Junker did not reach Zanzibar until 1886, when he went to Germany and wrote his *Reisen in Afrika*, 1889-91. He died at St. Petersburg, Feb. 13, 1892.

Junkers, HUGO (1859-1935). German aircraft designer. Born at Rheydt, Feb. 3, 1859, he was trained as an engineer, and by 1895 was head of his own concern producing gas heaters. Professor of thermodynamics at Aix-la-Chapelle 1897-1912, Junkers patented the first all-wing aeroplane in 1910. The J1 of 1915 was the pioneer all-metal aircraft. In 1919 he founded the Junkers works at Dessau and produced all-metal monoplanes which formed the nucleus of the German commercial fleet. He also made aero-engines, including the first satisfactory Diesels. He retired in 1932 and died at Gauting, near Munich, Feb. 2, 1935. Junkers bombers (Ju 87, Ju 88, etc.) and transports (*e.g.* the ubiquitous Ju 52) were first-line military machines of the Second Great War. See Aeroplane illus., p. 132.

Junket. Dish of milk solidified with rennet, sweetened with sugar, and flavoured with nutmeg, liqueurs, etc. The name was once applied to cream cheeses served in rush baskets; hence its name from Lat. *juncus*, a rush. Devon and Cornwall are noted for junket.

Juno. In Roman mythology, one of the major deities, identified with the Greek Hera. She was the sister and wife of Jupiter and queen of heaven, and her power as such was greater than that of Hera, the wife of Zeus. She was jealous and vindictive. Juno, Jupiter, and Minerva formed a



Junk. A Chinese sailing ship

trinity which protected the Roman state. Juno played an important part in relation to the life of women. She watched over them at their birth and throughout their life, just as the genius did over men. As the patroness of marriage and the goddess of childbirth, she was named Lucina, the bringer to the light. On March 1 married women celebrated in her honour the festival of the Matronalia, at which gifts of flowers were offered in her temple on the Esquiline hill. According to the legend, the festival was established by Romulus to commemorate the rape of the Sabine women and the institution of marriage. See Hera.

Juno. One of the asteroids, the third to be discovered. Recognized by Harding in 1804, it has a diameter of about 120 m., and takes just over four years to go round the sun. See Asteroids.

Juno and the Paycock. Tragicomedy in 3 acts by Sean O'Casey. First produced at the Abbey Theatre, Dublin, March 3, 1924, and at the Royalty Theatre, London, Nov. 16, 1925, this play established its author's reputation and was awarded the Hawthornden prize for 1926. Set in a Dublin tenement during "the troubles," it was remarkable for rich and varied dialogue, with alternating humour and pathos. Revivals included those at the Fortune Theatre, 1926; Duchess Theatre, 1930. Barry Fitzgerald and Sara Allgood played in the original production.

Junot, ANDOCHE (1771-1813). French soldier. Born at Bussy-le-Grand, Oct. 23, 1771, he entered



Andoche Junot,
French soldier

the army on the outbreak of the Revolution. He became secretary to Napoleon, with whom he went to Italy in 1796 and to Egypt in 1798, winning renown for his daring feats but showing little capacity for high command. For a time he was a prisoner in England, after which he was sent to Portugal as ambassador. Her served in Italy and as governor of Paris before being sent, in 1807, at the head of an army into Portugal. He gained some successes, but was beaten at Vimiera, and, by the convention of Cintra, agreed perforce to withdraw from that country, and went to Spain. His active military career came to an end when Napoleon, displeased with his conduct in the

Russian expedition of 1812, made him governor of Illyria. Always rather eccentric, his mind became unhinged, and he threw himself from a window, near Dijon, dying a week later as the result, July 29, 1813. For his services in Portugal Junot was made duke of Abrantes.

Junot, LAURETTE St. MARTIN PERMON (1784-1838). A French writer. Born at Montpellier, Nov.



Laurette Junot,
French writer

6, 1784, she married in 1800 Andoche Junot (v.s.), who owed much to Napoleon's friendship with his wife's family. She is best remembered by her *Memoirs of*

Napoleon, the Revolution, Consulate, Empire, and Restoration, 1831-35. She was renowned for wit, and in her salon were gathered some of the most influential Frenchmen of the day. She died in Paris, June 7, 1838.

Junta (Lat. *juncta*, joined). A Spanish term for a small committee or rather body of men acting in unison. It was applied to the committees that looked after various departments of state, and in the 17th and 18th centuries to informal bodies chosen in times of unrest. The Inquisition had its supreme junta, and the word has spread to Spanish America. In England, in the form *junto*, it was applied disparagingly to the Whigs who controlled affairs of state under William III.

Jupiter (Lat. *Jovis pater*, Father Jove). In Roman mythology, a divinity identified with the Greek Zeus. He was known by different forms of the name in Italy and by various distinctive epithets. His name etymologically signifies "light-father," and he was especially associated with the heavens, and with rain, thunder, lightning, and with the growth of the fruits of the field. He then came to be regarded as the god of hospitality, truth, and justice in local and international relations, and as such was associated or identified with *Dius Fidius*, the god of oaths. War god and giver of victory, he was known as *Stator*, the stayer of flight, *Victor*, and *Feretrius*,

the striker of enemies, to whom the spoils taken by the victorious from the defeated general were dedicated. In early times, as Jupiter Latiaris he had a temple on the Alban mount, where the Latin towns offered sacrifice to him at the Latin festival. When the worship of Janus declined, Jupiter became chief god of the Romans; his temple on the Capitoline Hill, the temple of Jupiter Optimus Maximus (best and greatest), was regarded as the heart of the Roman state. See Zeus.

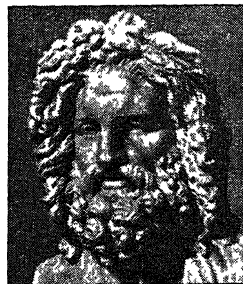
Jupiter. Largest of the major planets. Exceeding in volume and mass all the other planets put together, it has an equatorial diameter of 88,770 m. and a polar diameter of 83,010 m. Its volume is almost 1,320 times that of the earth; its mass about 318 times; and its density approximately 1.33, a little more than that of water.

The mean distance of Jupiter from the sun is 483,900,000 m., and the eccentricity of its elliptical orbit is such that at its greatest distance from the sun it is 46,600,000 m. farther away than its nearest approach. The planet revolves on its axis in about 9 hrs. 55 mins. The inclination of its orbit to the plane of the ecliptic is about 1° 18', and the inclination of its polar axis to the plane of its orbit is almost a right angle, so that the planet during its journey of 11 years 314.8 days round the sun has no seasons. The only variations experienced in the light and heat received by its surface from the sun are those due to the changing distance on its elliptical path.

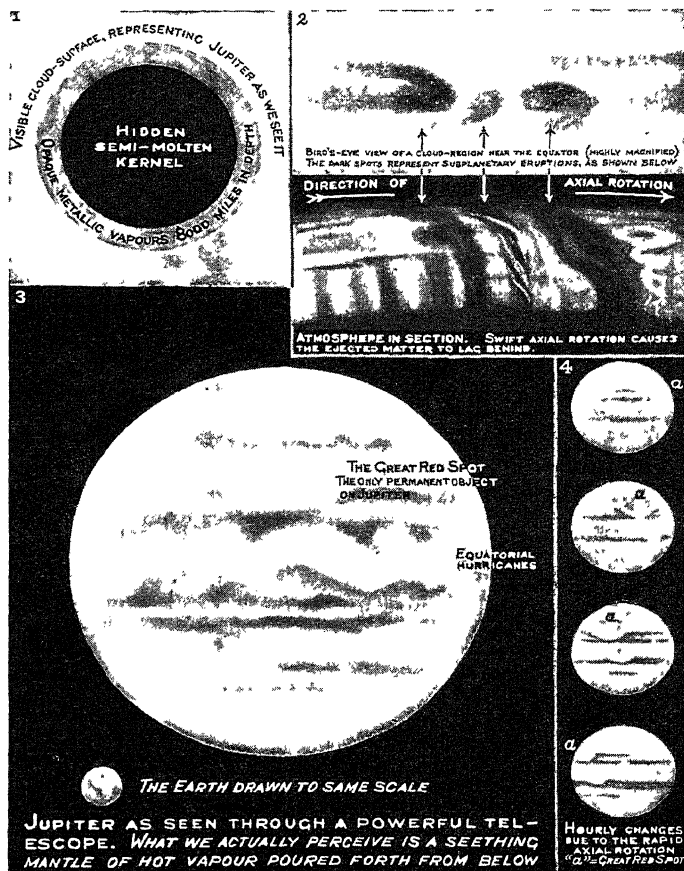
These variations are insignificant, for the amount of light and heat received from the sun at any time by Jupiter is small, no greater than $\frac{1}{4}$ the intensity of that which falls on the earth. Jupiter's visible surface, or more properly its atmosphere, is in a state of continual commotion. It appears covered with conspicuous and variable

markings, bands, and spots. The bands divide the surface into zones, suggesting that we see the moving currents of the Jovian atmosphere.

Features appearing in the various belts show that the zones have different rates of rotation, varying slightly but not uniformly with the latitude and with time. Most markings



Jupiter. Chief of the
Roman pantheon
From a bust in the Vatican



Jupiter. Aspects of the greatest planet of the solar system. 1. Diagram showing concealed semi-solid core. 2. Diagram illustrating how atmospheric disturbances produce the surface markings seen by an observer. Upper layers of atmosphere lag behind the more swiftly rotating core. 3. The Great Red Spot, the only permanent marking on the visible exterior of the planet. 4. Diagram showing by various positions of the great spot and other markings, at hourly intervals, the rapid rotation of the planet which causes it to be greater from east to west than from north to south.

last only a few weeks or months, but some semi-permanent features persist for dozens of years. The most remarkable of these is the great red spot, first noted in 1878, whose size has reached three times that of the earth. It is too persistent to be a cloud, yet it cannot be due to volcanic activity on the planet's hidden surface, for its rotation period has varied by several seconds.

The spectrum of Jupiter is that of reflected sunlight from which the Jovian atmosphere absorbs strong bands in the orange and red regions. These were identified by Wildt and Dunham in 1932 as due to methane and ammonia, in amounts corresponding to layers respectively half a mile and 30 ft. thick under normal terrestrial conditions. It is likely that the main constituent of the atmosphere is hydrogen (not

detectable spectroscopically) and that the clouds may be caused by ammonia crystals condensed at the low temperature (-216°F.) observed for the visible disk.

Jupiter has eleven satellites. The first four were discovered by Galileo, Jan. 7, 1610. Their distances from the planet are 262,200 m., 417,200 m., 665,500 m., and 1,170,600 m. respectively. The inner two are about the size of our moon; the outer two approach the size of Mercury or Mars. A fifth satellite was discovered by Barnard at the Lick Observatory, Sept. 9, 1892. It is very small and much nearer than any other. In Dec., 1904, and Jan., 1905, two more were found by Perrine at the same observatory. They are very small and faint. An eighth satellite of Jupiter was discovered by Melotte of Greenwich Observatory, Feb. 28, 1908. The ninth,

tenth, and eleventh satellites were discovered photographically by Nicholson, the ninth in 1914 and the others in 1938. They are faint objects, probably only about 20 m. across. Annual variations in the times of eclipse of the bright Galilean satellites were attributed by Roemer in 1675 to the finite time taken by their light to cross the earth's orbit.

Jupiter Symphony. Name given to the highest numbered symphony by Mozart—No. 41, in C major (in Köchel catalogue, 551). It was written concurrently with two other great symphonies, 39 and 40, June-Aug., 1788. Brilliant counterpoint and the blending of poignancy with joyousness entitle it to the rank of a masterpiece.

Jura. An island of the Inner Hebrides, Argyllshire. Its greatest length is 28 m. and its greatest breadth 8 m., its area being 143 sq. m. The island is one of the most rugged and bleak of the group. Deer forests cover a large portion of it, cattle and sheep being also reared. Its surface is hilly, and the range, the Paps of Jura, has peaks up to 2,571 ft. The island is separated from the mainland by the Sound of Jura; this is 21 m. long and from 3 m. to 6 m. broad. The Sound of Islay separates it from Islay on the S.W. Tarbert Loch almost cuts the island in two. A ferry connects it with the mainland. The name means red deer. Pop. 600.

Jura. A broad range of mountains in Europe. They lie between the Rhine and Rhône valleys, forming the Franco-Swiss frontier in the depts. of Doubs, Jura, and Ain, and the cantons of Berne, Neuchâtel, and Vaud. Average alt. is 2,000 ft. to 2,600 ft.

The best known peaks are the Crête de la Neige (5,654 ft.), the Chasseron (5,286 ft.), Mt. Tendre (5,515 ft.), and the Dôle (5,505 ft.). The principal passes are Pontarlier and the Col de la Faucille. The limestone mountains abound in stalactite caverns, while many of the rivers flow underground. In the pine forests wolves and the brown bear are found, and in the fertile valleys are vineyards.

Jura. Dept. of France. It lies contiguous with the depts. of Ain, Saône-et-Loire, Côte d'Or, Haute-Saône, Doubs, and with Switzerland, and was thus part of the old province of Franche-Comté. The greater part is mountainous, with the W. part of the Jura Mts. covering the southern half, rising in places to about 5,000 ft. The river Ain rises in the dept. and

flows through it in a S. direction, other rivers being the Doubs, Loue, Bienne, and Valouze. In the N. are a number of small lakes, and the Forêt de Chaux is the chief of the wooded tracts.

Agriculture is extensive, and in the central region are vineyards. Cattle and sheep are grazed, and cheese-making is important, Gruyère being the most famous variety. The chief minerals are coal, iron, and marble, and salt is obtained at Lons-le-Saunier, the capital, and at Salins. The other chief towns are Dôle, Poligny, St. Claude, Arbois, Dampierre, and Champagnole. Area, 1,951 sq. miles. Pop. 216,386.

Juralillo (*Calea zacatechichi*). Shrub of the family Compositae. A native of Mexico, it has opposite, heart-shaped, oval leaves and small yellow flower-heads. The fresh leaves are employed as a medicine in fevers, and in a powdered condition applied to wounds.

Jura Regalia. Proprietary rights of the British crown, including the prerogative rights to bona vacantia, waifs, wrecks, estrays, treasure trove, royal mines, fish, and swans, and Admiralty droits. Together with the remaining hereditary revenues of the crown, they are surrendered to the nation by each sovereign at the beginning of his reign, in return for a fixed annual payment called the civil list (*q.v.*).

Jurassic System. In geology, the division of strata between the Triassic and the Cretaceous, and so named from the Jura Mountains of Switzerland, largely composed of rocks of this period.

The main groups into which the Jurassic strata of Great Britain are subdivided are shown in the following list, in which the oldest beds are at the bottom.

UPPER JURASSIC (Upper Oolites)

Purbeck Beds
Portland Beds
Kimmeridge Clay
Corallian Beds
Oxford Clay

MID-JURASSIC (Mid and Inferior Oolites)

Cornbrash
Forest Marble
Great Oolite
Fulleis' Earth
Inferior Oolite

LOWER JURASSIC (Lias)

Upper Lias
Middle Lias
Lower Lias

By palaeontological study these groups can be further subdivided according to their fossil contents.

In England, Jurassic rocks form a band across the country from the Dorset coast to Cleveland, Yorks. They consist mainly of clays and limestones, with lesser

amounts of sands. The hard limestone beds form ridges and escarpments, such as the Cotswold Hills, and the clay beds are marked by broad depressions of arable or pasture. The beds were laid down in a shallow sea at the close of the Trias—Jurassic deposits are dominantly marine. Later fresh water conditions again became established, and the Purbeck Beds were deposited in a lake which persisted into early Cretaceous (Wealden) times. In N.W. Scotland, the Inner Hebrides, Sutherland, and N. Yorks many Jurassic beds are of estuarine or deltaic type.

This period of time was prolific in giant tree ferns, cycads, conifers, etc., and extensive fossil remains are found, the countless shells including those of nautiloids, ammonites, belemnites, lamellibranchs, etc., as well as corals. Fossil reptile remains are so numerous as to have given the Jurassic the alternative name of the reptile age, turtles, lizards, ichthyosauria, dinosauria, and pterosauria being found in the fossil state. Archaeopteryx, the earliest known bird, belongs to this period. Over 4,000 species of Jurassic fossils are known.

These rocks have economic uses. Oolitic limestones of Bath, Portland, Cheltenham, etc., are quarried for building stone. For brick and tile-making, Oxford Clay is in demand. Where limestone and clay are available in the right proportions, cement is manufactured. An iron ore industry has been developed by open-cast mining in the Mid-Jurassic of Northants, Rutland, and S. Lincs. Other products include jet, fullers' earth, lignite, and ornamental stones (Purbeck and Forest mar-

ble). See Cretaceous System: Geology; Lias; Oolite; consult The Jurassic System in Great Britain, W. J. Arkell, 1933.

Gilbert Wilson, Ph.D.

Jurat. Literally, a person under oath (late Lat. *juratus*, sworn), and specifically, one sworn in on taking office. The term was applied to certain French municipal authorities, to the aldermen of the Cinque Ports, and is still the title of the 12 elected members of the royal courts of Jersey and of Guernsey, who administer justice under the bailiff as president. In English law, jurat is part of an affidavit reciting the names of the parties swearing it and when, where, and before whom it was sworn.

Jurisdiction (Lat. *jurisdictio*, administration of law). Extent of authority of a judge or a court, or sometimes of a sovereign state. The jurisdiction of the courts of a country as a whole is generally confined to its territory. English courts, however, exercise a personal jurisdiction; if A commits a wrong against B abroad, B can sue him in England, if he can find him there to serve a writ on him. But no court can authorise its writ to be served outside the limits of its own country. To do so would be an encroachment on the sovereignty of another state.

The jurisdiction of inferior courts is always limited—sometimes locally, e.g. the mayor's court, London; and sometimes as to subject-matter, e.g. the county courts can try actions of tort or contract up to only £200. Again, justices of the peace cannot try certain crimes, e.g. murder; nor inflict more than certain punishments.

JURISPRUDENCE: THEORY OF LAW

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Jurisprudence, the scientific theory of law, covers many different aspects, the chief divisions of which are considered here. See also articles on Ecclesiastical Law; International Law; Law; Roman Law; and entries on special fields of law, e.g. Divorce; Husband and Wife; Landlord; Label; Theft; and on the machinery of law, e.g. Assizes; Criminal Appeal, Court of; Equity; Judge

Historical jurisprudence (Lat. *jurisprudentia*, knowledge of the law) is concerned with the study of the principles underlying the evolution of law, from the legal habits of primitive communities to the complex legal organization of a modern western state. Most famous among the historical studies is Maine's theory, developed in his *Ancient Law*, 1868. It makes a distinction between static and progressive societies. All societies

move from the making of laws by personal command, which gradually developed into customs, to the making of codes of law, such as the Attic code of Solon or the twelve tables of Rome. Progressive societies continue their legal development through the stages of legal fiction, equity jurisdiction, and legislation. Maine's theory has inspired many studies of the legal habits of different peoples and civilizations. No less famous is

the German Savigny's theory that law making by codes is, on the whole, a secondary and objectionable form of legal development, and that the real agent of legal evolution is the "spirit of the people," evidenced by custom and language, and differing greatly as between nation and nation.

ANALYTICAL JURISPRUDENCE. The rise of highly organized states and the specialisation in them of law and the legal profession have led to the ascendancy of the so-called analytical school of jurisprudence, founded by the Englishman, John Austin. In his *Province of Jurisprudence Determined*, 1832, Austin attempted to determine the proper nature and function of jurisprudence, to define the notion of law, to classify the different branches of law, and to categorise rights and duties. Although much attacked and in need of many qualifications, Austin's work exercised a decisive influence on the science and analysis of law. Austin distinguished, in the first place, the analysis of law as it is (the proper task of the science of law) from analysis of the law as it ought to be, which is a matter of ethics and political philosophy, of concern to the legislator rather than to the lawyer.

Classifications of Law

In the second place, Austin defined law as a command of the sovereign in the state, imposing a duty on the subject and armed with the power of sanction. This is called the imperative theory of law, and on the whole it maintained its hold over jurisprudence, although a number of analytical jurists substituted for the command of the legislator the power of the courts to make laws by deciding cases. A development of this part of Austin's doctrine was Kelsen's theory analysing the process of law in a hierarchy of norms, descending from the authority of the sovereign lawgiver to individual judgements and contracts which give shape and individuality to the legal norms. One consequence of Austin's doctrine was the denial of the character of law to international law, which lacks a sovereign authority and the sanction to enforce international rules of behaviour.

In the third place, Austin classified the main branches of law and the nature of rights and duties. This remained the principal preoccupation of the analytical school, although in this respect Austin's doctrine was greatly modified. Classification of English law is

rather difficult because of the sprawling historical development and unsystematic character of that law. Classification is easier in Continental codifications, of which the German code of 1900 and the Swiss code of 1907 are good examples. American jurisprudence has also gone some way towards classification, by a series of semi-official restatements which arrange the different branches of the law systematically.

The fundamental distinction is that between public law and private law. Public law comprises the legal relations between the state and other public authorities on the one hand and the citizen on the other. This includes constitutional law and administrative law, that is, the rules which govern the relations between administrative authorities (e.g. ministries, public corporations, local authorities) and the individual. Continental countries, following the French example, have long recognized the importance of this part of law and developed a special system of administrative law and administrative courts. The common law system has so far not been thus adopted, but the steady increase of state control and social services, and in the exercise of economic activities by public authorities, makes the development of the system of administrative law inevitable. Another important branch of public law is criminal law which, in England, is not codified, but contained in a number of individual statutes.

Divisions of Private Law

Private law is usually divided into the law of persons, which defines the nature of legal personality, both of individuals and corporate bodies and the capacities of special classes of persons, e.g. infants, married women; the law of obligation, which includes both contracts and delicts; the law of things, which regulates the rules of property and possession, the transfer of rights both mobile and immobile, conveyance of land, etc.; family law, which determines the relations between husband and wife, parents and children, etc.; the law of succession, which determines the principles of testate and intestate inheritance. A more general division which cuts across this system is that between rights in personam and rights in rem.

Particular attention has been devoted by students of jurisprudence to the analysis of rights and duties. Current jurisprudence, based on the teaching of the

American Hohfeld, has made much progress in this field, by distinguishing between claims, corresponding to duties, liberties, or privileges (such as the liberty to make defamatory statements in parliament), powers (such as the power of appointment or the power of alienating property), and immunities, that is, the freedom of a person from interference in doing certain acts. It should be noted that some writers, e.g. Duguit and Kelsen, deny that the individual has any legal rights and claim that law is only a hierarchy of legal duties. This is connected with a political philosophy which stresses the claims of the community against the individual, a conception exploited and abused in recent times by totalitarian states.

The Three Sources of Law

Another aspect of analytical jurisprudence, often described as the analysis of sources of law, is concerned with the different types and manifestations of law. The division usually adopted by English writers is that into custom, equity, judicial decision or precedent, and legislation. Equity in English law is a special set of rules developed by the chancellors, and later by the equity courts, to mitigate the rigour of the common law. But, in a general sense, it is known to all legal systems as a method of judicial interpretation, describing the necessity to interpret legal relations, transactions, and obligations with a view to fairness in the individual case as against the abstract rigour of the general rule. Equity is thus an instrument of legal interpretation, rather than a type or source of law.

Of the other three sources of law custom plays a predominant role in primitive societies and in international law, that is to say in all societies where legislative authority is weakly developed and community habits are strong and persistent. Custom still predominates in most communities outside Western civilization, but, though it is of some, is of much less significance in the modern state. It is stronger in peasant than in industrial societies. In contemporary English law, custom remains of importance mainly in the field of commercial usages and of certain ancient communal rights, such as rights of way, or local fishing rights. Whether custom is binding law without the specific sanction of the state, that is, recognition by the courts or other official agencies, is an old but somewhat sterile controversy. The answer depends

on one's conception of law. In the highly organized communities of today practice favours the view that custom, whilst still important as a source of legal rules, derives its legal validity from the express or tacit sanction of the state.

STATUTE LAW AND CASE LAW. A contrast is usually drawn between the Continental systems, in which the bulk of the law is embodied in codes—that is, in a series of comprehensive regulations of different branches of the law, which it is the task of courts to interpret and develop intelligently—and the Anglo-American system, which is dominated by precedent, that is, by legal development through a succession of judicial decisions based on the principles laid down in previous decisions.

Agents of Legal Development

This contrast should not, however, be exaggerated. It is true that a code lays down legal principles in a general and comprehensive form, so that judicial officers are left with the task of applying general principles to the infinite variety of individual situations and new problems; while a precedent system finds the law gropingly, from case to case, and much less systematically. But on the one hand, the weight of judicial authority and precedent is great in Continental systems, mainly through the constant jurisdiction of the higher courts; for all law needs continuity and stability. On the other hand, systematic principles are increasingly developed in the Anglo-American legal system, through the jurisdiction of the house of lords and other high courts, through text books, and, in the U.S.A., through semi-official restatements of the law. A case law system being less adapted to current needs than a statute system, legal development in the Anglo-American sphere shows a steady increase of statute law, at the expense of the case method of common law, and a growing need for codification. It should also be noted that in Great Britain the common law courts are no longer the sole or even the predominating agents of legal development. A multitude of special tribunals, such as housing tribunals, unemployment assistance boards, transport tribunals, etc., determine an increasing number of vital legal relations, and the need for their coordination in a system of administrative courts is urgent.

FUNCTIONAL JURISPRUDENCE. Jurisprudence has been increas-

ingly concerned with the functional as distinct from the analytical aspects of law. Legal decisions and relations are determined not only by abstract concepts, but by a weighing of social interests, such as the balancing of the rights of individual property against social welfare, of free enterprise against duties to employees, etc. The object of functional jurisprudence is the study of law as it works, in terms of social interests and other non-logical factors. It includes an appreciation of the social factors determining the making and development of law, such as social environment, the personalities of judges, the cost of litigation, etc. Functional jurisprudence is not a substitute for analytical jurisprudence, but a necessary supplement. Its main aspect, the sociology of law, is still in the infancy of its development.

TELEOLOGICAL JURISPRUDENCE. This, the philosophy of law, or the study of law's ends and purposes, is the oldest branch of jurisprudence, close to and often mixed with both philosophy and political science. It cannot, however, be dissociated from either the theoretical or the practical study of law. The rigid distinction made by Austin between the law as it is and the law as it ought to be has long been recognized as fallacious. Not only the legislator, but the practical lawyer must and does develop the law according to certain ends, which are derived from changing principles of political and social philosophy, ethics, religion, etc. Even within living memory, English law has seen a change from a strongly individualist and capitalist interpretation of law to one emphasizing social responsibility. This has been largely the work of the legislator, but hardly less the result of legal development through judicial and administrative decisions. The principles underlying legal interpretation of, for example, freedom of trade, the rights of collective organization, the responsibilities of the employer and the manufacturer, are today very different from those of 50 years ago. Jurisprudence therefore consists not of one or the other of its different branches but of all of them in conjunction. The lawyer cannot afford to neglect any of them.

Bibliography. Austinian Theory of Law, W. Jethro Brown, 1906; Ancient Law, Sir H. Maine, ed. Sir F. Pollock, 1906; Jurisprudence, J. W. Salmond, 10th ed.

by Gl. Williams, 1947; Text Book of Jurisprudence, G. W. Paton, 1946; Legal Theory, W. Friedmann, 2nd ed., 1947.

Jury. Body of persons sworn to carry out certain public duties, usually the finding of a verdict on evidence laid before them. Juries, however, may be required to carry out other duties, e.g. to assess damages before a sheriff, or compensation for the compulsory purchase of land.

In English law juries may be petty, special (rarely), juries (which until 1949 were called common juries and are now simply juries), or coroners' juries. Formerly there were also grand juries who in criminal proceedings decided from the written depositions containing the evidence of the prosecution whether there was a *prima facie* case against an accused person. If there was, they found a true bill of indictment and presented the accused to the petty jury for trial. Grand juries were abolished with a few exceptions in 1933, and entirely abolished in 1948.

Petty juries hear criminal cases; civil jury cases were until 1949 heard by either special juries or common juries. In 1949 special juries were abolished, except in commercial cases in the City of London, and common juries ceased to be so called.

Qualifications for Service

Members of all these kinds of juries except coroners' juries are taken from the annual electoral register. Qualifications for petty, and for what may now be called ordinary, jurors are the same; special jurors must have additional qualifications. A coroner's jury need only be "good and lawful" men or women. The persons whose names appear in the register are, subject to disqualification and exemptions, British subjects (women since 1919) between the ages of 21 and 60 if they (a) possess freehold land worth £10 a year or leaseholds for at least 21 years or for life worth £20 a year, or (b) reside in houses of the rateable value of £30 in Middlesex and London or £20 elsewhere. There are special qualifications in the City of London. Persons convicted of "infamous crime" are disqualified. Aliens domiciled in England or Wales for at least 10 years are liable to serve on a coroner's jury.

A list of exemptions includes peers, M.P.s, clergymen, judges, practising barristers and solicitors, police officers, practising doctors and chemists, officers of the forces

on full pay, regular soldiers and airmen and members of the women's services, officers and men of the Territorial Army or Auxiliary Air Force, post office officials, and women in religious orders.

Persons required for a jury (except a coroner's jury or a county court jury) are summoned by the sheriff through a bailiff, the summons being served usually by registered post six clear days before attendance is required. The number of women summoned must bear the same proportion to the number of men as does the number of women to the total number on the jurors' books. Husband and wife must not be summoned together. A coroner's jury is summoned by the coroner, and a county court jury by the registrar. Jurors failing to attend may be fined. For a coroner's jury from 7 to 11 jurors may be sworn; for petty, special, or ordinary juries 12; and for a county court jury eight. If there are not enough jurors present to make up the required number, a *tales de circumstantibus* may be had, i.e. persons present in court may be empanelled.

The verdict of the jury must be given in open court. That of a petty, special, ordinary, or county court jury must be unanimous, unless in civil cases the parties agree to take a majority verdict; a coroner may accept a majority verdict if the minority is not more than two; in Scotland majority verdicts may be brought in all cases.

During the trial the jury may be allowed to separate. They may have a fire out of court and reasonable refreshment at their own expense unless the sheriff chooses to pay. Persons summoned to attend as jurors are since 1949 entitled to receive a travelling and subsistence allowance, and in addition compensation for loss of earnings which cannot exceed 10s. for four hours or 20s. for over four hours.

Cases Tried by Jury.

A person charged with any crime other than assault is entitled to be tried by a jury if the maximum punishment that could be inflicted on him exceeds three months' imprisonment. As to civil proceedings, in cases in the king's bench division trial by jury is much less frequent than formerly. There is now a right to trial by jury only where the person applying for the jury is accused of fraud or in actions of libel, slander, malicious prosecution, false imprisonment, seduction, or breach of promise;

and even in these cases the court may refuse trial by jury if the action involves prolonged examination of documents or accounts, or a scientific or local investigation. In other high court actions the court has complete discretion to decide whether the action shall be tried by jury or by a judge alone, and trial is usually by a judge alone. The rules in county court actions are similar to those obtaining in the high court.

During the Second Great War juries were reduced to seven persons except in criminal cases involving a grave charge, and no civil case could be tried with a jury without a special order of the court.

Jury Mast. Temporary masts erected to replace masts that have been lost or are being repaired. Jury is shortened from *ajury* (old Fr. *ajurie*, assistance). The word is applied to any temporary device on board ship, e.g. jury rig.

Jus Gentium (Latin, law of peoples). Term frequently used in Roman law for the law common to all peoples as distinct from that of the Romans themselves. It was a collection of rules and principles, determined by observation to be common to the institutions which prevailed among the various Italian tribes. Somewhat later it was assumed to be the same as an imagined law of nature which men had obeyed before the world was parcelled into separate states. This *jus gentium* is not, as is often thought, international law, although the *jus gentium* has not been without its influence on international law (*q.v.*). See also Law; Roman Law.

Jus Primae Noctis. Custom by which a husband surrendered his wife for the first night after their marriage to a lord or other person of authority. The extent to which it prevailed is a matter of controversy. Some hold that, known as the *droit du seigneur*, it was associated with feudalism, but this is doubtful. Blackstone considered that it gave rise to the custom of Borough English (*q.v.*).

Jus Relictae (Lat., the widow's right). Term in Scottish law for a widow's vested right to a share in her husband's movable property. Her share is one-third if there are surviving children, one-half if there are not, and it cannot be otherwise disposed of by the husband by will. It may, however, be expressly excluded by antenuptial contract or satisfied by provision made during the husband's lifetime. See Legitim.

Jusserand, JEAN ADRIEN ANTOINE JULES (1855-1932). French author and diplomatist. Born at



Jean Jusserand, French diplomatist

Lyons, Feb. 18, 1855, he entered the diplomatic service and served at the embassy in London, 1887-90, as minister to Denmark, 1898-1902, then as ambassador to the U.S.A. until his retirement in 1925. He achieved distinction as a writer on English history and literature, particularly on Shakespeare and earlier dramatists. He died July 18, 1932. Amongst his best-known works were: *English Wayfaring Life in the Middle Ages*, 1889; *Piers Plowman*, 1894; *Literary History of the English People*, 1895; *Ronsard*, 1913; *With Americans of Past and Present Days*, 1916; *School for Ambassadors*, 1924; *What Me Befell* (unfinished memoirs), 1933.

Jussieu. The name of a French family, several members of which were eminent botanists. Antoine Laurent de Jussieu (1748-1836) was born at Lyons, April 12, 1748, and became a doctor. His uncle Bernard (1699-1777) took up a position in the botanical gardens in Paris, where in 1775 Antoine joined him. In a sense he completed the natural system of the classification of plants; Bauhin had established the characters of the species, Ray had separated the flowering plants into the great divisions of monocotyledons and dicotyledons, leaving to Jussieu, in his *Genera Plantarum*, 1789, to advance the system by assigning characters to the order. He was professor of botany at the museum of natural history, Paris, 1770-1826, and died Sept. 17, 1836.

Antoine's son Adrien (1797-1853), born in Paris, Dec. 23, 1797, succeeded his father as professor and wrote some botanical works of high value, notably his *Botany*, which was translated into the principal languages of Europe, including English. He died June 29, 1853. Bernard's brothers, Antoine and Joseph, also achieved note; all were the sons of an apothecary.



A. L. de Jussieu, French botanist

Justice of the Peace. Unpaid magistrate appointed by special commission from the crown under the great seal, jointly and severally to keep the peace and, any two or more of them, to inquire of and determine felonies and other misdemeanours. The office dates in almost its present form from the time of Edward III. Qualifications for the office are good reputation and, subject to certain exceptions, residence within 15 m. of the county or borough for which they are appointed. Since 1919 women may be appointed. In the counties the lord chancellor appoints justices on the advice of the lord lieutenant and an advisory committee; in boroughs on that of the borough advisory committee.

J.P.s act as judges of county quarter sessions, attend borough quarter sessions, and adjudicate in courts of summary jurisdiction and petty sessions (magistrates' courts) not presided over by a stipendiary or a metropolitan magistrate.

A justice may apply to be placed on a supplemental list, and, under the Justices of the Peace Act, 1949, is automatically placed on it at 75 years of age subject to certain exceptions. The lord chancellor may also direct the name of any person to be placed on the list if he is unfit by reason of age (even if under 75) or infirmity, or neglects his duties. Justices on this list cannot exercise judicial functions, and are entitled merely to witness documents, give certificates, etc.

Under the Justices of the Peace Act, 1949, travelling and lodging allowances may be paid; separate commissions of the peace exist only in counties, county boroughs, and non-county boroughs which possess certain qualifications; courses of instruction are provided for J.P.s.

Justiciar. The name given in medieval times in England to the chief officer of state, the equivalent of the modern prime minister. As the name implies, he was originally concerned with the administration of justice, presiding in both the king's court and in the exchequer, but his duties soon became more general. A justiciar first appeared in the reign of William the Conqueror, and the office lasted until that of Henry III.; a little later the chancellor took his place. Philip Basset was the last chief justiciar of England, 1261. There was also a justiciar in Scotland in early times. See Chancellor.

Justiciary. The name given in former times in England to the high judicial officer more usually



Justinian I. Portrait from a mosaic in the Basilica of S. Apollinare Nuovo, Ravenna

known as the justiciar. The high court of justiciary is the name for the supreme criminal court in Scotland. An act of 1672 established the court of justiciary, consisting of the justice general, justice clerk, and five judges of the court of session. The court is now constituted under the Criminal Procedure (Scotland) Act, 1887, and consists of all the judges as lords commissioners of justiciary. In trials usually only one judge sits; appeals are heard by three or more. The court sits in Edinburgh, but the judges also go on circuit (west, north, or south). Special sittings can be arranged in any town if desirable.

Justification (Lat. *justificare*, to prove just). Term used in English law. It means that in cases of libel and slander, the defence set up is that the words complained of are true in substance and in fact. In civil proceedings this is a complete defence; but in proceedings for criminal libel the defendant must also prove that the words were published for the benefit of the public. In actions of assault, also, the defendant may justify the assault by showing that he used the violence complained of in defence of himself, his wife, child, or servant, or of his property.

Justin I. East Roman emperor, 518–27. A rough soldier, probably a Goth by birth, he made his way to the command of the imperial guards, and was proclaimed emperor by the soldiery on the death of Anastasius.

Justin II. East Roman emperor, 565–78. He was nephew of Justinian I, whom he succeeded at an advanced age. In 574 he became subject to fits of insanity and nominated Tiberius, commander of the imperial guards, as joint ruler. During his reign and that of

his successor Tiberius, northern Italy was lost to the Lombards, the Avars overran the Danubian and Carpathian districts, and war broke out afresh with Persia.

Justinian I (483–565). Roman emperor. Born in Illyricum, May 11, 483, of Thracian or possibly Slavonic descent, he succeeded his uncle Justin in 527. The seat of the Roman Empire was then at Constantinople; its authority received no more than a formal recognition W. of the Adriatic. On the E. the Empire was assailed by the power of Persia. Justinian's generals, Belisarius (*q.v.*) and afterwards Narses, rolled back the Persians, recovered the mastery of the African provinces by the destruction of the Vandal kingdom, and momentarily restored the imperial dominion in Italy by the overthrow and dispersion of the Ostrogoths. (See Goths.)

The permanent fame of Justinian, however, rests upon his colossal achievement in the great codification of Roman law, which became the basis of all the European systems except in England. This was accomplished in three great works: the Code, which dealt with legislative enactments; the Digest or Appendix, which dealt with what may be called case-made law (interpretations and precedents laid down by lawyers which had acquired a binding force); and the Institutes, which were in essence an exposition of and a commentary on the principle and practice of law. Justinian died Nov. 14, 565.

Justinian II (669–711). East Roman emperor 685–95 and 705–11, last of the Heraclian dynasty. His extravagance in building and his oppressive taxation led to a revolt, and he was banished to Cherson. After the reigns of Leontius and Tiberius, Justinian, who had taken refuge with the Bulgarians, was reinstated on the throne by their king Terbelis. He inaugurated his second period of rule by a fearful massacre. An expedition against Cherson failed owing to a mutiny of the fleet. An Armenian, Bardanes Philippicus, was made emperor and Justinian was beheaded in December 711.

Justin Martyr (c. 100–165). Christian apologist. A Samaritan, with Greek parents, as a youth he



Justinian II, Roman emperor From a bust

studied the Stoic and Platonic philosophies. He became a Christian through the study of the O.T., but continued to lecture in philosophy at Rome, Ephesus, and elsewhere. He was martyred about 165. In his famous Apologies for the Christians he vigorously defended Christianity against the charges of heathen writers. His dialogue with Trypho the Jew defends Christian theology against the objections of the Jews.

Just So Stories. A book for children by Rudyard Kipling, published 1902 after serial appearance in an American magazine. It consists of amusing quasi-legends about the origins of things, with such titles as *How the Whale Got his Throat*, *How the Leopard got his Spots*, *How the First Letter was Written*. Kipling himself illustrated the work, which is also interspersed with verses, some of which, e.g. *The Camelious Hump*, *Rolling Down to Rio*, were set as songs by Sir Edward German.

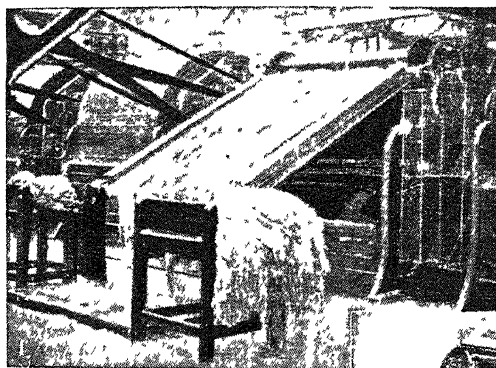
Jute. Fibre obtained from two varieties of the *Corchorus* plant grown in India, chiefly in Bengal and Assam. The plants have a stem of 5 ft. to 10 ft. and the fibre occurs as bast below the bark. Strips 4 ft. to 7 ft. in length are thus obtained and are manufactured into goods, principally in the Calcutta and Dundee jute mills. The fibre is more woody than linen or hemp and lends itself especially to the manufacture of packing canvas. Qualities vary in colour, lustre, and the fineness of the division. The higher grades make bright web for cheap tapestries, cart covers, stair carpets, carpet backings, and stiff linings. Lower grades are used to make fabrics which are the base of floorcloths and linoleums, school bags, scenic canvas, and upholstery backings.

Jute is spun on flyer frames and woven upon appropriately heavy looms. The cloth is starched and

calendered, thus being more or less flattened and glazed. The yarn or cloth may be dyed or bleached.

Jute is in effect a coarser flax or hemp, and has been manufactured in Dundee on a commercial scale since about 1840, and in Calcutta since 1855. Prices of the fibre fluctuate heavily without bringing into view any alternative cheaper fibres capable of performing the same functions. The virtues which make jute acceptable for wrappings for merchandise mark it out as pre-eminently the material for sandbags and forage sacks in time of war. The sewing of bags to standard sizes for the packing of produce is a considerable auxiliary industry, and these bags, when of Indian manufacture, are known by the native name of gunnies. See *Rope*; *Sack*; *Sandbag*.

Jüterbog. Town of East Germany, in Brandenburg. It is a rly. junction on the Nuthe, and



affluent of the Havel, 27 m. S. of Potsdam, and is an old town, with part of its fortifications, including three gates, still standing. Buildings of interest include the 15th century church of S. Nicholas, three other medieval churches, the Rathaus, and the Abbot's House, once connected with the Cistercian abbey of Zinna. In 1815 the town fell to Prussia. Industries include spinning and dyeing. Pop. 8,240.

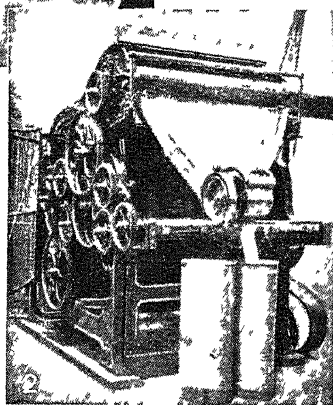
Jutes. Name of a Teutonic tribe. They invaded England in the 5th century, traditionally at the invitation of the Britons. They are mentioned by Bede, and the theory is that they settled in Kent and in the Isle of Wight. Who the Jutes were and what was their original home is uncertain. See *Britain*; *Kent*.

Jutigalpa or **JUTICALPA.** Town of Honduras. It is the capital of the Olancho dept., 100 m. by motor road N.E. of Tegucigalpa, the capital of the country. There

are important gold mines near, and an extensive trade is carried on in cattle and agricultural produce.

Jutland (Dan. *Jylland*). Largest and only mainland prov. of Denmark. The N. portion of the Cimbric peninsula, it is the only large peninsula in Europe that points due N. (See *Chersonese*; *Cimbri*.) It is bounded on the N. by the Skagerrak, S. by Slesvig-Holstein, W. by the North Sea, and E. by the Kattegat. The coastline is much broken by fjords, the L. of insulating the N. Area, 11,411 sq. m.

The country is generally low-lying, and presents little picturesque scenery. The surface rises to 564 ft. in the interior, where there are many heaths, sand dunes, lakes, and streams. On the arable oxen, sheep, and goats are reared. There are several good harbours on the E. coast, Aarhus being the chief. The longest river is the Guden, 80 m. in length, discharging into the Kattegat, 15 m. N.E. of Randers. Minerals are confined to iron, limestone, and marble. There is a rly. from Ribe to Hjørring, with lateral branches. The



Jute. Feeder end (1) and delivery end (2) of the machine in which the fibre is split and carded, to emerge as a continuous strand.

name of Jutland is derived from the nation of Jutes who dwelt on the peninsula. It was early an independent kingdom, but it was conquered by Gorm, king of Denmark, who died 936. There was some demand in 1945 that the German prov. of S. Slesvig be included in Jutland. Pop. 1,826,056.



Jute. 1. Complete plant. 2. Detail of foliage. 3. Flower. 4. Seed-pod

JUTLAND: THE NAVAL BATTLE OF 1916

This great naval engagement in the North Sea, one of the outstanding battles of the First Great War, remains historically important less for its immediate tactical results than because of the controversy which arose and the lessons which were learned from it. See Sea Power; also biographies of Beatty, Jellicoe, etc.

The battle of Jutland, fought between ships of the British and German navies, May 31, 1916, provided one of those historic occasions over which controversy will rage as to what might have been. Two fleets, the mightiest the world had seen, steamed out to give battle, made touch, lost it, recovered it, and finally parted because neither commander could risk the ultimate issue. Reinhard von Scheer, the German admiral, never intended to pit his 27 capital ships against the British 37; he hoped to entice part of the Grand Fleet towards the Norwegian coast and there destroy it with submarines and mines. For Sir John Jellicoe, commanding the British fleet, the supreme duty was not to be defeated; in palliation of all that admiral's caution, Winston Churchill has written: "Jellicoe was the only man on either side who could lose the war in an afternoon." The stakes in an engagement were not equal when one side depended utterly on naval power. In a memorandum approved by the Admiralty in 1914, Jellicoe had stated that if a German battle fleet turned away from the British navy, he would assume that the intention was to draw him into minefields or submarines, and would refuse to follow.

Action Without Victory

Thus the supreme conflict, foreseen and prepared for by the naval experts of both countries, was never truly staged. On the events of Jutland, the Germans claimed a tactical victory. With a total tonnage of 563,000 against 845,000 in battleships and battle cruisers; with 110 ships of all kinds to oppose 149; outgunned by nearly 50 p.c., or by weight of broadside 100 p.c., they yet sank 14 ships, including three up-to-date battle cruisers, for the loss of eleven, inflicting 7,000 casualties against 3,000. On the other hand, as the German fleet caused no disruption in the defence of British waters or coasts, and showed no inclination to repeat the battle, its adventure was strategically without profit.

On the night of May 30 the Grand Fleet put out from its Scottish bases, having learnt that the German navy would operate next day against commerce at the

entrance to the Skagerrak. Jellicoe left Scapa with 24 battleships and three battle cruisers. From Rosyth sailed Sir David Beatty, 65 m. ahead of his chief, with four battleships and six battle cruisers. Attached to the various squadrons were 34 cruisers and 78 destroyers. A speed of over 20 knots could be maintained.

Early next day Scheer was making for the Skagerrak with 16 Dreadnoughts, six old battleships that were full out at 17 knots, and preceding him a squadron of five battle cruisers under Hipper, who was, with Beatty, to undergo the fiercest action. Eleven light cruisers and 72 destroyers made up the German armada.

The First Phase

Neither side had perfect intelligence of the other's position on May 31, and Beatty was about to turn back towards the main fleet when at 2.20 p.m. his light cruiser Galatea signalled, "Enemy in sight." All six battle cruisers gave chase, but the 5th battle squadron (Barham, Valiant, Malaya, Warspite) was already astern and failed to turn quickly enough. The Germans on their part had not expected to meet heavy vessels so soon. Hipper therefore turned S.E. to lead his antagonist towards Scheer's main fleet. The first phase, and principal action, of this battle was accordingly between six British and five German battle cruisers.

Fire was opened at over 10 m. at 3.47. The German marksman-ship was brilliant: at 4 o'clock Beatty's flagship, the Lion, was hit by a shell and might have been lost had not a mortally wounded officer ordered the magazines to be flooded; next minute the Indefatigable was blown up by a salvo from the Von der Tann, and at 4.26 the Queen Mary vanished in an explosion after a hit from the Derfflinger. At this point Beatty, with a third of his squadron lost, his own ship on fire, and a signalman telling him in error that the Princess Royal had blown up, said to his captain, "Chatfield, there seems to be something wrong with our — ships today," and turned two points nearer the enemy.

When Beatty sighted the full German array at 4.42, he in turn

tried to lead towards Jellicoe, with whom he was not in visual touch. The 5th battle squadron in changing course came under fire from several ships so that all except the Valiant were heavily damaged, but the light was now favouring the British, who repeatedly hit Hipper's flagship, the Lutzow, and her companions. Hood's squadron of three battle cruisers, sent ahead by Jellicoe, bore down upon the engagement, wrecking the cruiser Wiesbaden at once.

Before the Grand Fleet was ready for battle it had to deploy into line. The choice before Jellicoe, coming up with six columns each of four ships, was whether to deploy towards or away from the enemy; i.e. should the column nearest or farthest from the battle go into the lead? The first and bolder course carried great tactical risks; but the movement might have been covered by Beatty, not to mention Arbuthnot's 1st cruiser squadron, and by it the Germans might have been thrown out of balance when they were already astonished at Hood's arrival. In taking the prudent line, deploying away, the British admiral is said to have avoided defeat but ended all hope of victory. Deployment started at 6.15 when German shells were actually straddling the fleet. Before it was finished Hood's flagship, the Invincible, trying to take the head of Beatty's line, was blown up by the Lützow and Derfflinger; while Arbuthnot went down in the Defence, and his Warrior was disabled.

Manoeuvres and Miscalculations

Scheer, thinking he might presently be surrounded, turned his whole line W. at 6.35 and soon was clear of the action. Here the battle might have ended had he not at 6.55 decided to run back E., perhaps hoping to pass across the British rear, do more damage, and get home. While he was thus completing a loop, the British described a segment of a circle about him; and again at 7.10 each commander found himself in an undesirable position. For now Jellicoe, steaming S. in echelon, was open to flank attack; while Scheer had arrived in the middle of his adversary's line instead of at one end of it.

After Hipper's battered squadron had come in for more trouble, the Germans managed to repeat the turning movement W., while Jellicoe, faithful to his plan of resisting every lure, turned away. The Germans availed themselves

of smoke screens as well as the mist, while Beatty pursued them and at 7.47 signalled to his chief, "Submit van of battle fleet follow battle cruisers; we can then cut off whole of enemy's battle fleet." Nearly half an hour passed before this was granted—too late. Night fell, and nothing but torpedo action could be expected.

Obviously Scheer could not let himself be caught by daylight with the British fleet between him and Germany. He set a course S.S.E. and took a chance of collisions in the dark. Late at night the British Admiralty stated his course to Jellicoe, who mistrusted the message in view of earlier errors in signalling and intelligence. It was known that waters near Heligoland were mined, but there were several channels by which the Germans might safely return, and Jellicoe could not watch them all. By continuing to steam ahead till daybreak he hoped to finish in sight of some of these routes. As it happened, the Germans chose to withdraw to Horn Reef, and while the

British moved steadily S.S.E. they followed some 10 m. astern. At one point they crossed the track behind Jellicoe, and a brief violent action cost both sides cruisers and destroyers. The Lützow was abandoned and torpedoed by the Germans. About 2.10 a.m. of June 1, Stirling's 12th destroyer flotilla sank the old battleship Pommern. This ended the fighting, for when Jellicoe finally turned N. at dawn he passed too far from Horn Reef to renew it.

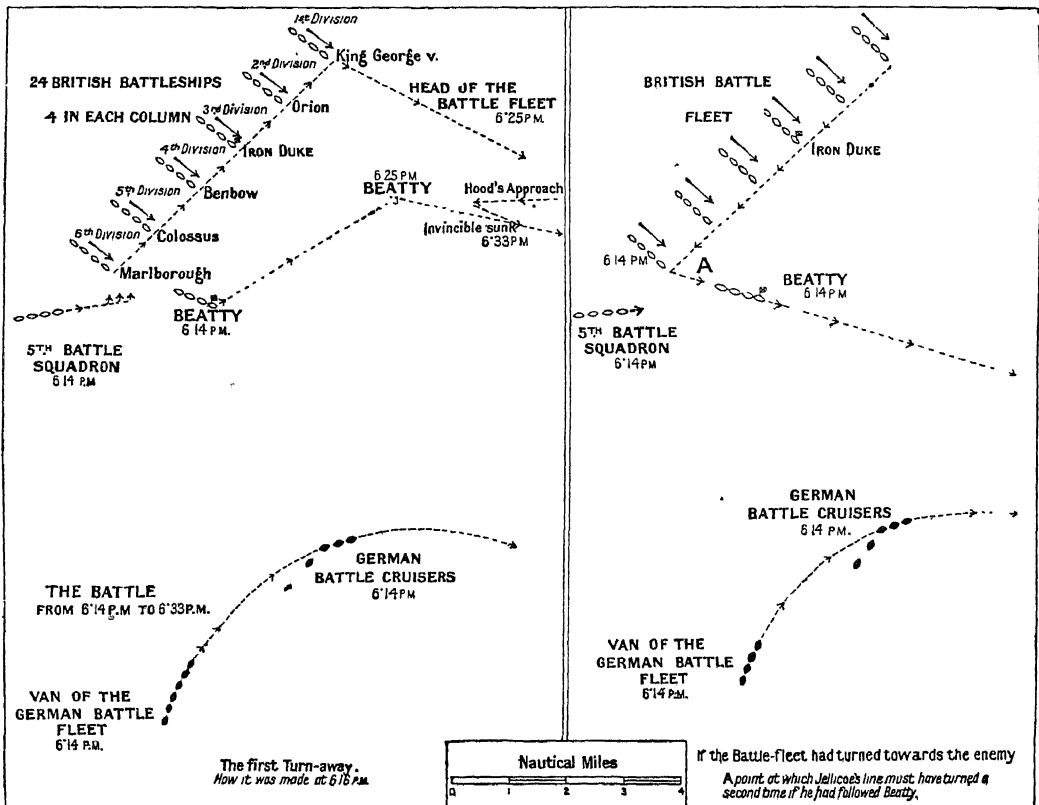
Jutland was a disappointment to the navy, and the news was received with dissatisfaction by the British public. Clearly tactics had been dominated by a conception quite unlike that of Nelson, who sought to destroy the enemy without regard for losses. Yet still, ship for ship and man for man, the British had suffered worse. Jellicoe claimed that his superiority in firing power was nullified because the German rangefinding and direction system was better. He was criticised most for not exploiting his sheer weight of tonnage. Those dangers

of mine and submarine, on which his note of 1914 had been based, did not apply in this particular battle; and as for torpedoes, only one of his destroyers and the enemy Pommern were known to have been accounted for by this weapon, of which probably 200 were fired. Against all this, of Jellicoe's 24 battleships only the Colossus had been struck by a shell, and that fleet suffered just seven casualties. It was intact for every demand that might yet be made. Nor, as it happened, would the enemy face it again.

Both commanders published accounts of Jutland: Jellicoe in *The Grand Fleet, 1919*; Scheer in *Germany's High Sea Fleet in the World War, 1920*. Consult also *History of the Great War: Naval Operations*, Sir J. S. Corbett, 1921.

Alan Phillips

Juvenal (c. A. D. 60–140). Roman satirist, whose full name was Decimus Junius Juvenalis. His life extended from the reign of Nero to that of Antoninus Pius, but details are obscure. The man-



Jutland Battle. Diagrams illustrating, left, the way in which, when the enemy fleet was curving round to the east and south-east, the British battle-fleet turned to the north-east; right, what the position would have been if Jellicoe had turned towards the enemy

ners and morals of the age in which he lived were regarded by Juvenal with loathing and indignation, which find expression in his sixteen satires. The popular conception of the Roman Empire as a mass of iniquity and corruption, both public and private, is largely due to the pictures drawn by Juvenal and Tacitus.

Inasmuch as modern research has found abundant records to prove the existence of good government and contented people during the period in question, one is naturally led to doubt the accuracy of these pictures. The explanation for Juvenal's work probably is that in all great cities there are elements deserving denunciation of the moralist. So it was in the Rome of the early empire, and the satirist was temperamentally inclined to dwell on vices rather than virtues of contemporary life. His best known and, in spite of its revolting indecency, probably his greatest satire is the sixth, on Women.

Another fine piece of work is the third, on Rome. This was imitated successfully in his poem *London* by Samuel Johnson, who also finely adapted the tenth satire as *The Vanity of Human Wishes*. The later satires are more mellow in tone than the earlier ones. Juvenal abounds in familiar quotations, such as *Mens sana in corpore sano* (a sound mind in a sound body); *Quis custodiet ipsos custodes?* (who will guard the guardians themselves?). The best editions with Eng. notes are by J. D. Lewis, 1873, also with Eng. trans.; J. E. B. Mayor, 1888-93. There is a complete verse trans. by W. Gifford, 1802, and a prose trans. by G. G. Ramsay, 1918. See *Satire*.

Juvenile Courts. The special courts for hearing proceedings relating to children and young persons. In England, before the Children Act, 1908, these proceedings had to be heard in the police courts. It was felt that this was undesirable, as juveniles were brought into contact with criminals; juveniles in fact might come before the court not for any offence but merely because they had been found begging or wandering or destitute. The Children Act provided that a police court when hearing proceedings relating to juveniles under 16 must (unless the juvenile was charged jointly with an adult) sit in a different room or at a different time from the ordinary time and place of sitting. The public were excluded, while the press were admitted and could publish full reports.

The Children and Young Persons Act, 1933, and later amending acts repeated and extended these provisions. Special panels of justices are formed of persons specially qualified to deal with juveniles, and no one else may sit in juvenile courts. The press is still admitted, but no newspaper may publish

(unless given special permission to do so) photograph, name, address, or school of any juvenile concerned in the proceedings or any details likely to lead to identification. The age for juveniles has been extended from under 16 to under 17. Consult *Juvenile Courts*, F. T. Giles, 1946.

JUVENILE DELINQUENCY

The steps which the law may take to deter children and young persons from falling into crime, as well as its powers of punishment and treatment, are here described. See also Borstal; Juvenile Courts; Remand Home; and Schools: Approved

The term juvenile delinquency refers, not to mere domestic naughtiness, but to misbehaviour of children and adolescents serious enough to justify intervention by the state. It is a term of comparatively recent creation. In fact, only in 1847 did what it designates become recognized in the English legal code as something separate from adult delinquency. Until then the only youthful misconduct which would provoke society to act was a breach of the criminal law; and the only action taken was to administer one of the punishments used for adult malefactors, i.e. whipping, imprisonment, transportation, or hanging. Nowadays re-education, not punishment, is the basis of the methods adopted.

Under the Children and Young Persons Act, 1933, which contains the main statutory framework for the treatment of juvenile delinquency, every court in dealing with a child or young person must have regard to his welfare and must take steps to remove him from undesirable surroundings and to secure that proper provision is made for his education and training. These reformatory measures are available not only to juvenile delinquents but also to those who are only "in need of care and attention," i.e. those who are drifting into anti-social habits or have been the victims of neglect or brutality. The Children Act, 1948, further placed on the local authority a duty of providing for all orphans or deserted children.

"Children" are those under 14. Those under 8 can in no circumstances be charged with any offence. Children between 8 and 14 are presumed not to be criminally responsible for their actions unless it is proved that they knew they were doing wrong. "Young persons" are those between 14 and 17. No prison sentence can be passed by a magistrate's court on anyone under 17, nor by quarter sessions or assizes on anyone under

15, and persons over these ages and under 21 can be sent to prison only if there is no other appropriate method of dealing with them. Anyone guilty of an offence may, if the offence would have been punishable by imprisonment had it been committed by an adult, be sentenced to some form of detention which is not imprisonment. Those under 17 may be detained in a remand home for up to one month if there is no other suitable way of dealing with them, or in an approved school for a varying period up to three years. No child under 10 may be sent to an approved school, however, unless there is no other suitable way of dealing with him. Those under 17 who are guilty of some serious crime, such as attempted murder, may be detained indefinitely, subject to release by the home secretary on licence. Persons between 14 and 21 may be detained in a detention centre for a period of 1 to 6 months. When a person under 18 is guilty of murder he cannot be hanged, but is detained during His Majesty's pleasure. Juveniles between 16 and 21 convicted on indictment of an offence punishable with imprisonment may be sentenced to Borstal training (see *Borstal System*). A magistrate's court may require a person between 12 and 21 to attend at an attendance centre for a specified number of hours. A fine is frequently imposed for malicious damage by juveniles and, less frequently, for offences of dishonesty. The parent of an offender under 17 can be ordered to pay any monetary penalty imposed and, in the case of a child under 14, must be so ordered unless the court is satisfied that the offence was not attributable to lack of parental care.

The most usual form of treatment for offenders under 17 is one available also for adults, namely a probation order. This requires him to be under the supervision of a probation officer for a period of one to three years, and may in addition

require him to comply with certain requirements, e.g. that he shall live in an approved probation hostel or home, or undergo medical treatment to improve his mental condition. If he is over 14 these requirements can be imposed only with his consent. If he fails to comply with the requirements or commits another offence he may then be sentenced for the first offence. The court without making a probation order may discharge an accused person conditionally, i.e. subject to the condition that if he commits another offence within some period up to twelve months he may be then sentenced for the first offence.

Supervision by a probation officer can also be ordered in the case of juveniles who are in need of care or protection, beyond parental control, or playing truant from school.

For the juveniles placed under his care the probation officer is a kind of auxiliary parent, giving them guidance and control and also advising their parents in matters connected with their upbringing. This method of treatment usually permits reeducation to be undertaken in the home, though sometimes conditions there make it necessary for the probationer to live in a hostel for a period. At the same time, under the probation system a juvenile who does not respond satisfactorily to supervision can be brought back to the court for other treatment.

Care of a Fit Person

In cases where a juvenile has no home, or an undesirable one, and hostel treatment is not appropriate, there may be a commitment to the care of a fit person. A fit person order remains in force, unless varied, until the juvenile attains the age of 18 and involves a transfer of all parental rights and duties to the fit person. A local authority may act as a fit person. The fit person order treatment relies for its reformatory effect on the moral influence of a good home and, in practice, its use is restricted to care or protection and delinquency cases in the lower age groups where there is little or no serious moral deterioration.

About 3,000 children and young persons are sent annually to approved schools; these are the most recalcitrant of the offenders, and the worst tainted morally of the care or protection types. In the case of a person under 14 at the time of the order, detention may be for three years, or until the child is 4 months over school

leaving age, whichever is the longer period; in the case of persons between 14 and 17 detention is for 3 years, with the further provision that they cannot be detained beyond the age of 19. The home secretary may, however, discharge them at any time.

Some of the approved schools are owned and managed by philanthropic bodies; others are provided and controlled by local authorities. All are subject to Home Office certification and inspection. Their curriculum is mainly that of the ordinary primary school, plus vocational training for the older inmates. Their aim is that of any boarding school—to inculcate sound habits and social discipline through a regular, healthy routine and the good influence of the teachers.

To administer the judicial provisions of the code for juvenile delinquency there have been established special tribunals—the juvenile courts. Once they have found a case proved their object is to ascertain the form of treatment best suited to the individual before them by reference to his temperament and health and to the underlying causes of his predicament. Unless the case is a trivial one they are required by statute to consider, before reaching a decision, reports from the probation officer and the education authority on the juvenile and his home; they may also call for medical examinations and reports.

The segregation of juveniles from adult prisoners in police stations is a statutory requirement. To the same end local authorities are bound to establish remand homes for the reception of juveniles who have been ordered to be kept in custody pending the final disposal of their cases.

In treating juvenile delinquency great importance is attached to emotional influences, and changes of environment are relied on as correctives. There does indeed often seem to be a direct connexion between delinquency and some deep-seated childish unhappiness caused either by a sense of inferiority or by a broken home. But such feelings cannot account for juvenile delinquency as a whole. The fact that the slums yield the highest proportion of delinquents suggests that economic cum moral factors play a big part, and the all too frequent appearance in the juvenile courts of children from respectable homes gives additional emphasis to the moral element in the problem.

Official statistics of juvenile delinquency are not very helpful to the sociologist; they reveal nothing as to causes, and they give no reliable indication of the long-term results of the various methods of treatment. Between the two Great Wars the number of juveniles found guilty annually of offences of dishonesty (the major category in juvenile delinquency) roughly doubled, and in 1938 it was about equal to the number of adults convicted of similar offences. In the same period the percentage of the juvenile population charged annually with serious offences rose from .3 to .5. On this latter figure about 5 p.c. of the population would be juvenile delinquents at some period.


The Second Great War, like the First, saw a great increase in juvenile delinquency—the natural consequence of parental absences, a general relaxation of moral standards, and increased temptation. After 1945 the figures began to decline—as they did for a few years after 1918. Consult *The English Juvenile Court*, W. Elkin, 1938; *The Child and the Magistrate*, J. A. F. Watson, 1942; *The Juvenile Courts*, F. T. Giles, 1946; *Juvenile Delinquency and the Law*, A. E. Jones, 1945.

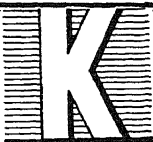
Juxon, WILLIAM (1582-1663). English prelate. Born at Chichester, he was educated for holy orders at S. John's College, Oxford, of which he became president in 1621. A protégé of Archbishop Laud, he held several court appointments, and became bishop of London in 1633. To the indignation of Puritans and Parliamentarians, he was made lord high treasurer, 1635, a post which he held until 1641. A trusted counsellor of Charles I, he served on the royal council of war, advised the king against consenting to Stafford's attainder, and attended him at his trial and execution; to Juxon Charles entrusted his last statement and personal desires. At the Restoration he became archbishop of Canterbury, dying June 4, 1663.








William Juxon,
English prelate

Jyotisha. Astronomical treatise, one of the MSS. of the Vedic period of Sanskrit literature. Written in verse, it is attributed to a scholar named Lagadha. It is the oldest known systematic treatise on the subject.

IN the evolution of the alphabet few letters changed their essential form less than the letter K. The earliest recognizable form was the Semitic  of about 1100 B.C., and the Phoenician version was almost identical. The Semitic name for the letter was *kaph*, meaning the palm of the hand, presumably with fingers extended. The Greeks, adopting the letter, also took on the name as *kappa*. Early Greek forms place the subsidiary strokes on either side of the vertical:

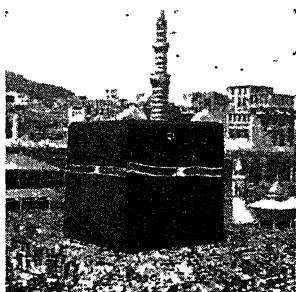


  , but always the vertical was relatively longer above and below than in the modern form, even in the classic Greek . It was in the Greek minuscule  that the vertical line was first shortened, leading to the Roman K. The modern minuscule k, in which the only differentiations are the ascendant vertical and the lower junction point is an obvious development caused by fluent penmanship over the centuries, and imitated by the designers of type.

K The eleventh letter of the English and Latin alphabets. In the latter, its sound being represented by C, it was regarded as superfluous and retained in only a few words. In English it has the value of hard c, as in *keel*, *kitchen*, but before *n* it is mute, as in *knock*. It is a hard or voiceless throat-sound, the soft or voiced equivalent of which is *g*. The combination *ck* was originally spelt *kk*, this double consonant being frequent after a short vowel, whenever *ed*, *er*, or *ing* followed. Modern English has retained *ck*, even when final, especially in monosyllabic words, though in others, *e.g.* music, it has disappeared. (See Alphabet; Phonetics.)

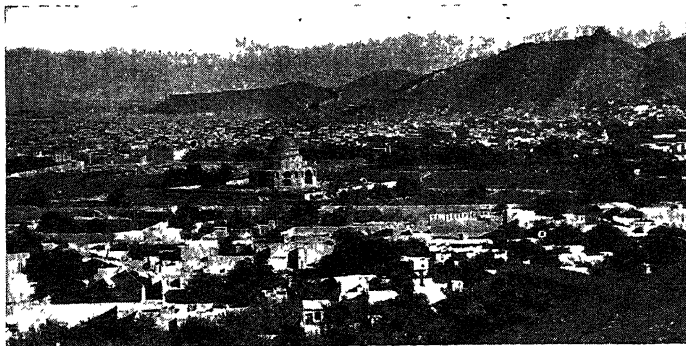
There is a certain amount of inconsistency in the spelling of English words derived from foreign languages, especially Greek. Thus, the correct form kinematics is in general use, but custom varies in regard to cinematograph or cinematograph, *c* being pronounced as *s* in the latter. The same applies to place-names, such as Kephallenia or Cephalonia, Karlsbad or Carlsbad; and Oriental words such as Ka'aba or Ca'aba, Kabbala or Cabbala, in some of which *q* is also sometimes used. The reader who does not find an entry under K should therefore refer to C.

Ka'aba (Arabic, chamber). A shrine at the Great Mosque of Mecca. The building, which stands in the centre of the court, is about 50 ft. high, 40 ft. long, and 30 ft. wide. Its peculiar sanctity is due to the Black Stone, which is built into the N.E. corner. Burton, one of the few Englishmen who have seen it, ascribed the stone to meteoric origin. Oval in shape, and from 6 ins. to 7 ins. in diameter, it must be kissed by every Muslim making the pilgrimage.



Ka'aba. Pilgrims gathered around the Muslim shrine in the centre of the court of the Great Mosque at Mecca

The present Ka'aba, built in 1626, reproduces the primitive idol temple venerated throughout Arabia in Mahomet's day. He destroyed the idols, but recognized the value of the fetish stone and the pilgrimages as a politically unifying force, and declared that the angel Gabriel had given the stone to Abraham, who had built the Ka'aba. The alleged graves of Hagar and Ishmael are at its foot. The Ka'aba is covered with a cloth



Kabul, the capital city of Afghanistan, with the tomb of Sultan Babar

of black brocade, replaced every year. See Holy Carpet; Mecca.

Kaap OR DE KAAP. Goldfields in the Barberton district of Transvaal, South Africa. Covering nearly 800 sq. m., they were discovered in 1875, but did not attract much notice until 1882. In 1886 a rush to the goldfields took place.

Kababish OR KABBABISH (Arab. goatherds). Strongest of the camel-owning nomad Arab tribes in the Anglo-Egyptian Sudan, affiliated to the Kawahla. Stalwart, black-haired, and mostly dark-skinned, they have been dominated by Arab rulers from early Mahomedan times. Some clans occupy villages near the left Nile bank from Dongola to Kordofan.

Kabardin. Autonomous republic of the R.S.F.S.R., also known as Balkaria-Kabardin. In the N. Caucasus, it is bordered on the S. by Georgia S.S.R. Nalchik is the chief town.

Kabul OR CABUL. A river of Afghanistan. Rising in the Hindu Kush, near the source of the Helmund, it flows through Afghanistan and falls into the Indus at Attock after a course of 270 m.

Kabul OR CABUL. Capital of

Afghanistan; also chief town of its prov. Situated on the Kabul river, it is beautifully placed on a high plateau, 6,900 ft., at the foot of hills, surrounded by a fertile district. Flowers, fruit, and fountains adorn it. Apart from the Bala Hissar, a fort now dismantled, it has few remarkable buildings. The junction of several great caravan roads, it has a considerable trade in carpets, silk, and cotton goods. A university was founded in 1932. There are a high court, military academy, and factories.

Taken by Tamerlane in 1394, and by Nadir Shah in 1739, for a time Kabul was the capital of the Mogul empire. The emperor Babar is buried here. Timur made it the capital of Afghanistan in 1774. During the Afghan Wars it was captured by the British in 1839, but lost by them two years later. The scene of the massacre of British troops in 1842, it was retaken by General Pollock in the same year. The murder of Cavagnari

the British political resident, and his escort, Sept. 3, 1879, led to the reoccupation of the city for a year. It was besieged by rebels against King Amanullah in 1928-29. Pop. 120,000. See Afghanistan; Afghan Wars; consult Forbidden Road, R. Forbes, 1937.

Kabyles (Arab. *gabail*, tribes). Term loosely applied to the agricultural Berber tribes of Algeria, Tunis, and a few Saharan oases. The hilly coast-region E. of Algiers is hence designated Kabylia. *Prov.* Kabilz. See Africa; Berbers.

Kachin OR **KAKHYEN**. Burmese collective name for hill-tribes inhabiting the Kachin Hills in N.W.



Kachin. Natives of the Burmese hills

Burma. Of the Tibeto-Burma sub-family, they number perhaps 150,000, excluding congeners across the Indian frontier. The Kachin of the N. are known as Khakhu and of the S. as Chingpaw.

Kaden-Bandrowski, JULIUSZ (b. 1885). A Polish author, born Feb. 24, 1885, at Rzeszow. He became at the end of the First Great War the outstanding novelist of resurrected Poland. While he dwelt upon subjects of his country's everyday life, he found international recognition of his artistry. Most of his voluminous novels were translated; outstanding are *Professions*, 1911; *Town of my Mother*, 1917; *The Bow*, 1919; *General Barcz*, 1923; *Black Wings*, 1928-29. Essays, Polish Literature, Trends, and Personalities appeared in 1928.

Kadesh (Hebr., consecrated). Name used in the O.T. for several places in Palestine. The place where the Hebrews encamped before entering the promised land took this name, and was probably identical with Petra. Miriam died here, and from Kadesh spies were sent out to survey Canaan.

Kadi. Subdivision and town in the Mehsana division of Bombay, India. The town is situated at the terminus of branch rly. from Kalol. The subdivision lies mainly in the S. of the division, W. of the Sabarmati river; the country is flat, the only eminences being hillocks of sandy loam about 50 ft. high. The chief crops are food grains, rice, cotton, tobacco, and oil-seeds. Area of subdivision, 333 sq. m. Pop. 111,894; town 17,165; nearly all Hindus.

Kadiak. Variant name of the island in the Gulf of Alaska known also as Kodiak (*q.v.*).

Kaf. In Mahomedan lore, mts. to which the last of the race of genii, who had inhabited the world before Adam, were driven by one of the ancient Persian kings.

Kaffa. An alternative name for the tributary state of Abyssinia better known as Gomara (*q.v.*).

Kaffa. Ancient name of the Crimean seaport now called Feodosia (*q.v.*) or Theodosia.

Kaffir OR **KÄFER** (Arab., infidel). Name applied in popular usage to the non-Muslim Bantu-speaking negroid peoples of S. Africa. Thus defined, it includes Bechuana, Basuto, and even Hereros and Ovambo, in all about 4,500,000. It is limited to certain aggressive tribal confederations, named after chiefs, who led the movement from equatorial Africa along the E. Highlands into the coastlands E. of the Drakensberg shortly before the European discovery.

The division of the S. Bantu is collectively called Zulu-Kaffir, whereof the Kaffir branch comprises the Tembus, Pondos, and Xosas. Slim, dark-brown, flat-nosed, long-headed, and 5 ft. 10 ins. in height, they subsist by cattle-breeding, hunting, and agriculture. The tribal arms were knobkerries, assagais, and oval hide shields. The kraals are cattle enclosures surrounded by huts, sometimes low wattle-and-daub cylinders with thatched domes.

Initiation rites include circumcision, except among the Zulus. The *hlonipa* custom enjoins the avoidance by women of the names of their husbands' relatives, and by men of the sight of their mothers-in-law. Social life was governed by ancestor worship—with an ultimate deified ancestor called by the Swazis Unkulunkulu—and by witchcraft. See Africa; Amaxosa; Bantu; Ethnology; Fingo; Kaffraria; Zulu.

Kaffir Bread. A farinaceous pith. It is obtained from the young shoots of the *Encephalartos caffer*,

the bread-tree, a cycad of South Africa. The tree reaches some 20 ft. in height, and is very ornamental in its growth. The pith forms a useful article of native food. See Cycadaceae.

Kaffir Wars. Name given to prolonged hostilities between the British and natives of the E. part of what is now the Cape Province of South Africa. The Kaffirs raided the farms of the colonists, lifted their cattle, and proved a general menace to peace. Under the influence of their witch-doctors they believed that when they had killed every head of cattle the white man possessed, all the ancient warriors of their tribe would rise from the sea and help to drive the hated invader into it.

The first Kaffir War began in 1809, and the Kaffirs were driven to the E. bank of the Great Fish river. In 1818-19 they rose under a prophet named Mokanna, and attacked Grahamstown; their frontier was then advanced to the Keiskamma river. Further trouble arose in 1828 and 1831. In 1834 some 12,000 Kaffirs laid waste the country between Somerset East and Algoa Bay. Ultimately they were driven back to the Great Kei river. The Dutch colonists had cause for discontent, and sought independence across the Vaal, while the Kaffirs were only temporarily subdued.

Hostilities broke out afresh in 1846-47. In 1850, the Gaikas, a clan of the Xosas, with the Amatembus and a number of Hottentots, once more invaded the white man's territory, and war lasted until 1853. The Xosa Kaffirs were deported from the Amatola Mts., and the district became known as Griqualand East (*q.v.*). In 1856 the Xosa Kaffirs were induced by their witch-doctors to destroy their cattle and crops; famine followed, and the desperate straits to which they were reduced brought on the war of 1858.

The last of the Kaffir wars began in 1877. First the Galekas, under Krel, were defeated; then the Gaikas rose under Sandili and Seyolo; the Zulu Cetywayo (*q.v.*) gave trouble; and peace was not restored until the middle of 1878. See Cape of Good Hope Province; Fingo; Matabel; Zulu.

Kaffraria. Part of the Cape of Good Hope prov., S. Africa. Once applied to the country inhabited by the Kaffirs, extending to the frontier of Natal through Transkei and Pondoland, the name is now correctly restricted to the coastal districts between the Great Kei

and Great Fish rivers. After the Kaffir War of 1846-47, British Kaffraria was formed into a separate prov., with East London as capital, which included the country between the Great Kei and the Keiskamma rivers, but was incorp. with Cape Colony in 1865. *See* Cape of Good Hope Province.

Kafir (Arab., infidel). Primitive tribes occupying the Afghan region of Kafiristan. The S. African Kaffirs have no racial relationship. Grouped into 18 clans, the best known are called Shiah-Posh (black-clad) from their dark woollen raiment. They resisted the Muslim propaganda. Their inaccessible fastnesses preserve a social organization based on ancestor - worship and ceremonial dancing, with some Hindu animism. *Consult* Kafirs of the Hindu-Kush, G. S. Robertson, 1896.

Kafiristan (Land of the Infidel). Eastern region of Afghanistan. The most westerly of the areas on the S. slopes of the Hindu-Kush, it was effectively occupied by the Afghans in 1896. It is a rugged area with narrow, tortuous river valleys lying W. of the Chitral river; all the streams drain to the Kabul river. The forests are of great economic importance; pomegranates and olives flourish on the lower slopes, pines and cedars on the higher ground. Area, 5,000 sq. m.

Kafka, FRANZ (1883-1924). An Austrian writer. Born in Prague, July 3, 1883, of Czech Jewish stock, he was educated at the university there, but abandoned a legal career for literature. He spent most of his life in Prague, travelling in France, Germany, and Italy. He died in a Vienna clinic, June 3, 1924, and was buried in Prague.

As a writer Kafka was concerned solely with man's search for absolute verities; in this he resembled Kierkegaard (*q.v.*). Reluctance to publish during his lifetime meant that his three great novels, *The Castle*, *The Trial*, and *America*, all unfinished, appeared posthumously. The recurrent theme of these works—a nameless hero wrestling with obscure and intimidating powers in quest of knowledge—reveals Kafka's preoccupation with the endless enigma of consciousness. Unknown during his lifetime, his novels and stories, e.g. *The Verdict*, *Metamorphosis*, *The Great Wall of China*, influenced literature after his death. His collected works appeared in 3 vols., 1935-37. *Consult* Life, M. Brod, trans. G. H. Roberts, 1947.

Kafue, KAFUKWE, OR LOENGWE. River of N. Rhodesia. Rising on the borders of the Belgian Congo, it joins the Zambezi about 90 m. W. of Zumbo. It is navigable for about 200 m. above the point near Kafue town where it is crossed by the rly. to the Belgian Congo and by the Great North Road. Kafue is the name of an administrative area in N. Rhodesia mainly drained by the river.

Kagera. River of Central Africa. It rises in Belgian Ruanda and flows near the borders of Uganda and Tanganyika before it enters Lake Victoria. It is navigable for small launches over certain sections and forms one of the principal headwaters of the Nile.

Kagoshima. Town of Japan. It is situated on the coast of Kagoshima Gulf in the S. of Kyushu; the harbour is deep and well protected, and is a centre for fisheries. It is connected by rly. with Moji in the N. and is the market for the stock, sweet potatoes, sugar-canes, tobacco, and gold of the surrounding district. The castle-city of the powerful Daimio Satsuma, Kagoshima was bombarded in 1863 by British warships in consequence of the murder of H. L. Richardson. In the war of 1877 it was burnt, but has been rebuilt. Pop. 181,736.

Kagu (*Rhinocetus jubatus*). Bird found in New Caledonia, related to the cranes. The size of the common fowl and grey in colour, it has a long pendent crest of feathers at the back of the head. It is rare and appears to feed at night on snails, worms, and insects. It has been kept in captivity in many zoological gardens. Its actual relationship to other birds has long been a subject of controversy.

Kahun. Ancient town in the Fayum, Upper Egypt. Excavated by Petrie in 1889, it comprised the dwellings of the workmen who constructed the XIIth dynasty Illahun pyramid for Senusert II. Within 18 acres were found 2,000 rooms of unburned brick, their rafters supported by the earliest timber columns known. The objects found included rakes, fire-drills, and tool baskets. *See* Egypt.

Kaieteur Falls. Cataract of British Guiana, on the Potaro river, a tributary of the Essequibo. Here the river makes a sheer fall of 741 ft. five times that of Niagara.

Kaifeng. Capital of Honan prov., China. It lies at a short distance from the S. bank of the Yellow river, and is linked by rly. with Nanking and Peking. It was the capital of the Empire

under the Sung dynasty (11th century), but retains little of its former importance. Here is a colony of Chinese Jews. Pop. 130,000.

Kaijo, SONGDO, KAISONG, OR KAISENG. Town of Korea. It is 30 miles by rly. N.N.W. of Keijo (Seoul). The town was the Korean capital under the Kaoli dynasty (918-1393). Old porcelain wares of the Kaoli period are found buried in the vicinity. Except for trade in these relics Kaijo owes its present prosperity to trade in ginseng (*q.v.*). It is a walled city.

Kail. Cultivated form (*Acephala*) of the wild cabbage (*Brassica oleracea*). The spelling kale is more common. *See* Borecole.

Kailas. Mt. peak in W. Tibet, near Lake Manasarowar. Also known as Kang-rinpoche, the Holy Mountain, and Gangri, the Ice Mountain, it is a place of pilgrimage for Hindus and Lamas, who walk or crawl round the 28 m. base. Alt. 20,226 ft.

The Kailas temple at Ellora, Hyderabad, is named after the mountain. It was hewn out of solid rock as a thank-offering for victory by the Gupta dynasty over the Chalukya dynasty in the 8th century, and is an astonishingly beautiful specimen of Hindu temple architecture.

Kailyard School. Name applied by J. H. Millar, or his editor W. E. Henley, in *The New Age*, 1895, to writers of novels of humble Scottish life notable for their sentimentality and over-use of dialect. In this school are generally included J. M. Barrie's *Auld Licht Idylls*, 1888; and the novels of John Watson (Ian Mac-laren) and S. R. Crockett. Henley appears to have taken the name from the song *There grows a bonnie brier bush in our kailyard*, which suggested the title of Mac-laren's *Beside the Bonnie Brier Bush*, 1894.

Kainite. A mineral, hydrated magnesium potassium chloride and sulphate ($KCl.MgSO_4.3H_2O$), occurring in the upper parts of saline residues formed under acid conditions by the evaporation of sea water in enclosed basins in past geological times. Kainite occurs in association with sylvite, carnallite, and similar salts at Stassfurt, Germany, and in the E. Carpathians. It is one of the chief sources of potassium.

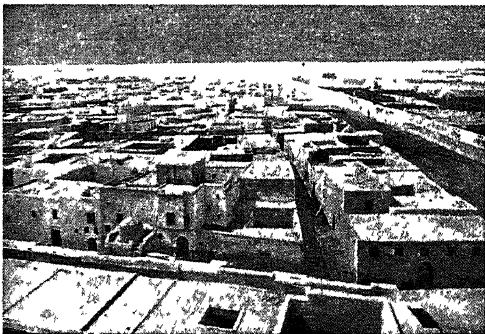
Kainsk. Town in the West Siberian region of R.S.F.S.R. It is 250 m. W.S.W. of Tomsk, on the river Om and the Trans-Siberian rly. The inhabitants are

occupied in agriculture, cattle rearing, tanning, and brick-making.

Kaipara. Natural harbour of N. Island, New Zealand, in the Auckland peninsula. The width at its entrance is about 5 m. From Helensville, the rly. terminus at its S. extremity, there is 120 m. of waterway to the mouth of the Wairoa river, itself navigable for ocean steamers for another 50 m. Along the long, narrow arm of the sea kauri timber is transported.

Kaiping. Town in Hopeh prov., China. It stands on the Pekin-Mukden rly. between Tientsin and Chinwangtao. The steam tramway, connecting coal mines at Tangshan and Kaiping, became the nucleus of the Pekin-Mukden line.

Kaira. Dist. and town in India, in the northern division of Bombay. Over two-thirds is under cultivation, millet and rice being the chief crops. The industries include calico printing and the manufacture of cotton goods. Among the exports are grain and tobacco. Area of dist., 1,617 sq. m.; pop., dist., 914,957; town, 9,500.



Kairwan, the Holy City of Tunisia, a centre of Mahomedan pilgrimage

Kairwan, KAIROUAN, OR QAIKWAN. An ancient walled city in Tunisia. It is 80 m. S. of Tunis, and is connected by rly. with the port of Susa. Founded about 670, it contains some 50 mosques and other ecclesiastical edifices, including the mosque of Okba or Ukbah, founder of the city. Kairwan is a centre of pilgrimage, venerated by the Mahomedans as a Holy City. Outside the walls is the mosque of the Prophet, built with materials from Carthage. Pop. 22,991.

Kaisar-i-Hind Medal. Decoration instituted by Queen Victoria in 1900 for award to persons, irrespective of sex, race, or occupation who had distinguished themselves in advancing the public interest in India. There were three classes, gold, silver, and bronze, and bars could be awarded. The

medal is worn on the left breast suspended from a pale blue ribbon.

Kaisariyeh or **KAYSERI.** City of Asiatic Turkey, the ancient Caesarea. It is situated 140 m. due N. of Adana, on the Kizil Irmak (Halys) river, and is a noted road centre, at the foot of Mt. Argaeus. It is the seat of three bishops, Greek, Armenian, and R.C. Rug and carpet weaving are local industries. The orchards and vineyards on the slopes of Argaeus are the finest in the country. The city contains the great mosque of Houen (Houvant) and a Seljukian castle. On the slopes of Argaeus lie the ruins of Mazaca, an earlier city, the ancient capital of Cappadocia. S. Basil was a native of Caesarea.

It has a pop. of 57,698 and gives its name to a vilayet with 371,125. A place in Palestine with this name will be found under Qisaraya.

Kaiser. The German word for emperor. It is a variant of Caesar, and was used for Charlemagne and the other emperors of the Holy Roman Empire. They claimed to be the successors of the Caesars, and the Germans took this word into their language soon after the coronation of Charlemagne in

800, rather than that of *imperator*, the formal Latin title, which in English and French became emperor and *empereur*. With the dissolution of the Holy Roman Empire



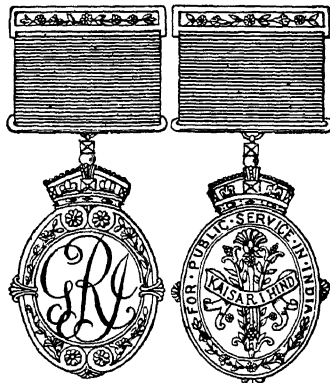
Kaisariyeh, Turkey. The city, with Mount Argaeus (Erdias Dag) in the background

in 1806, the title was transferred to the emperor of Austria, who remained a kaiser until 1918. In 1871 the king of Prussia took the title of *Deutscher Kaiser*, and from then until 1918 the three successive German emperors were in turn known popularly as the kaiser. See Emperor; Empire, Holy Roman; Germany; William II.

Kaiser, HENRY JOHN (b. 1882). American industrialist, born at Sprout Brook, N.Y., May 9, 1882. During 1914-30 he was engaged on highways and heavy construction projects. Then he became chairman of Six Companies Inc., constructors of Boulder and Parker dams. Entering shipbuilding in 1941, he revolutionised the industry by introducing prefabrication, assembling and launching 10,000-ton vessels in four days. This rapid production of shipping helped the Allies to overcome the menace of U-boats. In 1943 Kaiser was made chairman of Brewster Aeronautical corporation to accelerate aircraft production. See Liberty Ships.

Kaiser, ISABELLA (1866-1925). Swiss author and poet. She was born at Beckenried, Oct. 2, 1866, and died there Feb. 17, 1925. Her fame was won early as a completely bilingual writer. The best known among her novels are *When the Sun Sets*, 1903; *Our Father*, 1906; *Rahel's Love*, 1921—all in German—and *Marcienne de Fluë*, 1909; *The Virgin of the Lake*, 1913—both in French. Her German poems were published in 1908 under the title *My Heart*; her French ones, as *The Closed Garden*, in 1912.

Kaiserfahrt Canal. Artificial waterway of Poland, but in N. Germany when constructed. The



Kaisar-i-Hind Medal. Obverse and reverse of the Indian Empire medal

river Oder flows past the port of Stettin into the Stettiner Haff, which communicates to the Baltic Sea through three channels, the Peene, Swine, and Dievenow. The Swine or middle channel separates the two islands Usedom and Wollin, which block the mouth of the Haff. To shorten the navigation of the winding Swine, the Kaiserfahrt Canal, 3 m. in length, was cut across part of Usedom.

Kaiserin (Ger. empress). Feminine of kaiser, German title. In the empire which broke up in 1918, it was borne by three women: (1) Augusta, princess of Saxe-Weimar-Eisenach (1811-90), who married the emperor William I; (2) Victoria (1840-1901), daughter of Queen Victoria, who married the emperor Frederick, but was kaiserin only a few months; (3) Augusta Victoria, princess of Schleswig-Holstein, who married William II in 1881, shared his throne until his abdication in 1918, and died at Doorn, April 11, 1921.

Kaiserin-Augusta. River of Papua, now known as the Fly (q.v.). The former name applied when the area was part of German New Guinea.

Kaiserslautern. A town of Rhineland-Palatinate, Germany. It stands on the Lauter, 42 m. W. of Mannheim. After Ludwigshafen it was the largest town of the Bavarian Palatinate. It is a junction of several rlys., and important industrially. Founded in 882, it was made a free city in 1276. The name comes from Emperor Frederick Barbarossa's castle built near the river in 1152, destroyed by the French in 1703. There was much fighting between French and Prussians in the neighbourhood, 1793-94. Two 13th century churches survived. Industries comprised a famous sewing machine factory, bicycle works, textile factories, and breweries. There are a technical academy, art galleries, a permanent theatre, and a botanical garden. When on March 20, 1945, German resistance W. of the Rhine collapsed, American formations took Kaiserslautern virtually unopposed. Pop. 62,619.

Kaiserstuhl. Isolated volcanic mountain mass in Baden, Germany. It is situated between the Dreisam and the Rhine, 12 m. from Freiburg, and has upwards of 40 peaks, of which the highest exceeds 1,800 ft. in elevation. It is noted for its vineyards, and is reached by the Kaiserstuhl rly. from Riegel.

Kaiser Wilhelm Canal. German waterway connecting the Baltic with the North Sea. Named

in honour of the German emperor William I, it is now commonly known as the Kiel Canal (q.v.).

Kaiser Wilhelm's Land. Northern section of N.E. New Guinea, placed under Australian mandate after the peace treaty of 1919. It was declared a German protectorate in 1884. In 1914 it was occupied, without any opposition by Australian and New Zealand forces. See New Guinea.

Kaiser Wilhelm II Land. An Australian territory in the Antarctic regions. It lies S. of the Indian Ocean, in long. 86°-92° E., touching the Antarctic circle W. of Queen Mary Land. Posadowsky Bay indents its shores, and it contains Mt. Gaussberg (q.v.).

Kaithal. Subdivision and town of the Karnal district, Punjab, India. It is situated in the W. of the district, which is irrigated by the Sirsa branch of the Western Jumna Canal. The south of the sub-division is a fever-stricken marshy area. The district lapsed to the British government in 1843. The town is an ancient foundation, 40 m. W. of Karnal, and contains a fort built under Akbar. It is a centre of local trade. Subdivision: area, 1,273 sq. m.; pop. 332,303. Town: pop. 22,325.

Kaka (*Nestor meridionalis*). Olive-brown parrot of New Zealand. Closely related to the kea (q.v.), it is about the size of a crow. It has a light grey crown, the cheeks and collar are purple-bronze, the breast and tail brown, and the intervening underparts are deep crimson varying to orange or yellow. The upper half of the beak is long and hooked, used for stripping bark in order to obtain wood-feeding grubs; the bird eats fruit and flowers also. The four eggs are laid in hollow trees or rock crevices. Its note can be either a melodious whistle or a harsh chuckle; and when domesticated the bird becomes a good talker and clever mimic.

Kakapo, TARAPO, OR OWL PARROT (*Strigops habroptilus*). Bird of the parrot family (Psittacidae). It is a native of alpine districts and open forests in New Zealand. It has soft plumage, green on the upper parts, speckled with yellow and barred with brown; brown cheeks; and yellow underparts. A disk of feathers around the eye gives it an owl-like appearance. The wings are short and unfitted for proper flight. It spends the day in holes in or near the ground, and at night searches on foot, in companies, for seeds, berries, and lizards. Its tracks, a foot wide,

are plainly discernible across herbage next morning. Its note is a croak, but it can shriek also. It makes no nest, but deposits its two or three large eggs in a burrow. It is amenable to domestication.

Kakonda OR **CAKONDA.** Dist. and town in the Benguela prov. of Angola. It is about 110 m. in a direct line S.E. of Benguela.

Kala-Azar, DUM-DUM FEVER, OR BLACK FEVER. Disease due to infection with the parasite *Leishmania donovani*. Almost certainly introduced by the bite of the sand fly, it occurs in India, Arabia, China, N. Africa, and other tropical and sub-tropical regions. The disease begins with attacks of irregular fever alternating with periods without fever. The patient is acutely ill. Ultimately emaciation becomes extreme, the spleen is enlarged, changes in the blood are accompanied by internal haemorrhage, and death may occur in from one to two years. Antimony compounds, however, are specific, and with careful nursing and proper treatment the patient should recover within six months. Preventive treatment consists in segregation of the sick, destruction of infected houses, and war against the sand fly. Infantile kala-azar, due to infection by *Leishmania infantum*, is met with in S. Europe and N. Africa.

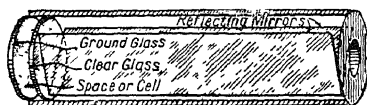
Kaladan OR **KULADAN.** River of N.W. Burma. After a course of 200 m., it enters the Bay of Bengal, 15 m. N.E. of Akyab. The lowest 90 miles are usually navigable. The Kaladan valley formed the eastern flank of the Arakan front during the Burma campaign of the Second Great War. It was held by the 81st West African division throughout the Japanese offensive and subsequent retreat in 1944.

Kalahandi OR **KAROND.** Former small Indian state, merged in 1948 in the state of Orissa. It lies W. of the E. Ghats. Many of the hills are forest-clad, but others have been cleared, and crops of rice, pulses, sugar-cane, etc., are grown. Area, 3,559 sq. m. Pop. 597,940.

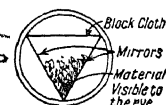
Kalahari. Desert or sandy tract on the W. of South Africa, mainly in Bechuanaland. It extends N. for 600 m. from the Orange river. Generally about 3,000 ft. high, bordered by a waterless country, it contains large tracts suitable for cattle, and, under a system of dry-farming, for the growing of cereals. The country is filled with large game, and supports a scattered and

nomad population. There are numerous salt pans, one at Makarikari covering more than 2,000 sq. m. Livingstone in 1849 first

Oct. 28-30, 1918, just before the signing by Turkey of the armistice with the Allies. See Mesopotamia, Conquest of.



Kaleidoscope. Diagram illustrating, left, general principles of the toy; right, the glasses and manner in which symmetrical patterns are produced



crossed the Kalahari. Consult Through the Kalahari Desert, G. A. Farini, 1886.

Kalakaua, DAVID (1836-91). King of the Hawaiian Islands. Born Nov. 16, 1836, he became king in 1874. The chief incident of his reign was the revolution which, in 1887, forced him to grant his people a new constitution, by which the royal power was greatly reduced. He died in San Francisco, Jan. 30, 1891, and was succeeded by his sister Liliuokalani (q.v.). See Hawaiian Islands.

Kalamata, KALAMATA, OR KALAMAI. Seaport of Greece, capital of the nome of Messenia. Situated on the E. side of the gulf of Mesenia, in the S.W. of the Morea, it is about 20 m. W. of Sparta, trades in oranges, figs, olives, and mulberries, and has a small silk industry. It is the terminus of the Morean rlys. from Corinth. German troops occupied Kalamata after the withdrawal of British Imperial forces in April, 1941, until Sept., 1944. Pop. 28,955.

Kalamazoo. City of Michigan, U.S.A., the co. seat of Kalamazoo co. On the Kalamazoo river, it is 50 m. S. of Grand Rapids, and is served by rlys. and an airport. It is a trading centre and shipping point for an area producing maize and grapes; makes more than 3,000,000 lb. of paper daily, as well as paper products; and produces oil of peppermint. Other manufactures include taxicabs, motor bodies, air-conditioning equipment, water and gas heaters, musical instruments, and fishing tackle. The city hall and county buildings are recent. Kalamazoo was settled 1829, incorporated 1843, and became a city in 1884. Pop. 54,097.

Kala Shergat, SHERGAT ALI, OR QAL A SHERQAT. A town in Iraq, the ancient Assur of Assyria. It lies on the Tigris about midway between the Great and Lesser Zab, both E. tributaries of the Tigris, and is 50 m. S. of Mosul. It is connected by rly. with Bagdad. Here, during the First Great War, the British under Gen. Marshall defeated the Turks,

Kalat. Semi-independent state of Baluchistan, Pakistan. It occupies more than half the prov. from the Arabian Sea N.E. almost to the Bolan Pass; on the W. and E. it is bounded by Persia and India; in the S.E. is the semi-independent state of Las Bela (q.v.). More than a third of the people are Brahuis; Baluchis and Jats make up most of the remainder. Sarawan in the N. is highland; wheat, tobacco, and fruit are obtained in the valleys. Jhalawan in the S.E. is an arid mountainous area inhabited by nomad shepherds. Kachhi in the N.E. is a vast alluvial plain of great fertility after a good rainy season, capable of yielding three crops annually, and noted for its breeds of horses and bullocks. Makran in the S.W. is an inhospitable desert which yields only dates. Kharan in the W. is an elevated plain, much of which is a sandy waste. The ruler bears the title of khan. Relations with the British government were defined by treaty of 1876; it acceded to the newly created dominion of Pakistan in 1948. The area of Kalat is 53,995 sq. m. Pop. 253,305, nearly all Mahomedans. Kalat town, the cap., is unimportant.

Kalatch. Name of two places in the U.S.S.R. (1) Town in the region, and 120 m. S.E., of Voronezh. It stands on the Podgornaya, a tributary of the Don, and has trade in grain and cattle. (2) Town in the Stalingrad region, 45 m. W. of that city. It is on the left bank of the Don and is the terminus of the Don-Volga rly. and the centre of a transport trade.

Kale. Name sometimes given to the perennial herb properly known as sea-kale (q.v.). For the winter vegetable see Borecole.

Kaleidoscope (Gr. *kalos*, beautiful; *eidos*, form; *skopein*, to

behold). Optical toy depending for its effects on the multiple reflections from two mirrors, sometimes three, usually placed at an angle of 60°. These mirrors extend the length of a tube, at one end of which are two plates of glass enclosing fragments of coloured material. The observer looks through a small eye piece at the other end of the tube, which, as it is turned in the hand, scatters the pieces of coloured material into arrangements that, being symmetrically reflected in the mirrors, give rise to an endless variety of regular patterns. Sir David Brewster invented the device in 1816.

Kalends (Lat. *kalendae*). Alternative spelling of Calends, first day of the Roman month. See Calends.

Kalevala. Traditional Finnish epic recovered from the lips of the people and pieced together by Elias Lönnrot. It was first published in 1835, and in a fuller version in 1849. An unrhymed metrical account of early legends of Finland, it is considered one of the chief epics of the world. It suggested to Longfellow the form of his *Hiawatha*. Consult Eng. trans. J. M. Crawford, 1889; W. F. Kirby, 1907. Many of Sibelius's orchestral works portray episodes from the Kalevala.

Kalgan OR CHANG-KIA-KAU. A town in Chahar prov., N. China. It is 124 m. by rail N.W. of Peking, at the entrance to the pass leading up to the Mongolian plateau. Kalgan is the greatest trade-mart in S.E. Mongolia; and is a terminus for caravans going N.W. across the Gobi desert to Urga and Siberia, and W. to Sinkiang. The outer line of the Great Wall passes here.

Kalgoorlie. Town in W. Australia, 380 m. E.N.E. of Perth by rail. A rly. junction for Mt. Margaret and Norseman Gold Fields, and for the transcontinental line into S. Australia, it is the greatest



Kalgoorlie. Part of the "golden mile" in this gold-mining town of W. Australia

gold producing area in the continent. The climate is arid. Established as a camp in the 1890s, Kalgoorlie is a thriving town with modern amenities and a fine water supply pumped 400 m. from Mundaring near the coast. Gold production to 1946 exceeds one hundred million pounds in value. Pop. 11,000.

Kali. In Hindu mythology, a name of the goddess Devi (*q.v.*), especially in her fearful aspects.

Kalidasa (fl. 500–550). Indian dramatist and poet. Hindu tradition assigns his date to the 1st century B.C.; the 6th century A.D. is more generally accepted. He wrote two love dramas, *Sakuntala* and *Vikramorvasi*, while *Malavika* and *Agnimitra* is also attributed to him. Some scholars think he represents more than one writer. Of the purely lyrical work associated with his name, the poem *Meghaduta* is regarded as the most masterly. Rich in fancy, master of form, and genuine in sentiment, Kalidasa is the great ornament of Sanskrit literature. *Sakuntala* was translated by William Jones in 1789, rendered into German by Forster in 1791, praised by Herder and Goethe, and gave impetus to Sanskrit study by Europeans.

Kalimantan. Name, under the provisional constitution of the U.S. of Indonesia, of (Dutch) Borneo.

Kalimno OR **KALYMNOS.** Island of Greece, the ancient Calymna. It is one of the Dodecanese and is about 12 m. N.W. of Kos (Cos). Sponge fishing is an industry. The chief place is Kalimno, pop. 15,247. The island covers 49 sq. m. Confirmed in the possession of Italy with the rest of the group in 1924, it was restored to Greece 1947. See *Dodecanese*.

Kalinga. Ancient kingdom of S. India, on the E. coast. It apparently consisted of an extensive tract between the Eastern Ghats and the sea, Mukhalingam, in Ganjam district, being the capital.

Kalinin. City of the R.S.F.S.R., capital of the region of the same name. Formerly Tver, it is situated on both banks of the Volga at its junction with the Tversta and the Leningrad-Moscow rly., 90 m. N.W. of Moscow. The capital of an independent principality in the 13th century, it was annexed by Ivan the Terrible in 1532. Noted for its 17th century cathedral and a palace built by Catherine II, Tver was rebuilt after the fire of 1763, and became one of Russia's most beautiful cities. Pop. 216,000.

During the Second Great War the Germans claimed the capture of Kalinin Oct. 16, 1941; but bitter fighting continued within and around the city until it was cleared by the Russians Dec. 15.

Kalinin, MIKHAIL IVANOVICH (1875–1946). A president of the supreme council of the Soviet Union. He was born of peasant stock in a village near Leningrad, Nov. 20, 1875, and left the village school at 14 to become a metalworker. In 1899 he was



Mikhail Kalinin,
U.S.S.R. president

first arrested for political activities. Later he became associated with Lenin and Stalin, but remained almost unknown until the government had been formed after the revolution of 1917, when he became president of the Petrograd (Leningrad) soviet. In 1923 Kalinin was appointed first president of the executive committee of the Soviet Union. He presided over the supreme council from 1938 until his resignation in March, 1946, for reasons of health. Kindly but shrewd, he was the Kremlin's closest link with the peasant classes. Kalinin died in Moscow, June 3, 1946. Tver had been renamed in his honour, and Königsberg, annexed from Germany, became Kaliningrad (*v.i.*).

Kaliningrad. A city of the R.S.F.S.R., formerly Königsberg, capital of East Prussia, before its annexation in 1945. In Hohenzollern days a royal residence with a vast palace, partly dating back to the Teutonic Knights, partly constructed by the first Prussian kings, the place was originally a castle built in 1255 and named in honour of King Ottokar of Bohemia, who thence set out on a crusade. Three surrounding boroughs gained urban rights and became important trading centres, amalgamating in 1724. The seat of the Teutonic Order, Königsberg witnessed the crowning of Frederick I, the first Prussian king, in 1701, and remained after Berlin the most important city of Prussia.

Standing almost on the coast with the great Frisches Haff forming a natural port, the main part of the city was built 4½ m. inland along both sides of the navigable Pregel, with the densely built-up island Kneiphof in its centre. The city was a centre of

trade in timber and agricultural products, and its industries comprised furniture making, flour milling, food preserving, cellulose and paper making, agricultural machinery, locomotives, chemicals, and textiles. Its prosperity vanished with the expelled Germans.

As the port, linked with the Pregel by a canal, handled over 1,500 seagoing vessels annually, and the city was one of Hitler's main arsenals, Königsberg was bombed by Allied aircraft in the Second Great War. It suffered still further damage when it was besieged, and on April 9, 1945, stormed by the Red army.

Destroyed buildings included 7 churches, dating from the 13th–18th centuries, the Gothic cathedral (1297–1302), the 14th century Rathaus, and university buildings erected during the 19th century. This university had existed since 1544 and achieved world fame through Immanuel Kant, a native of the city; its library contained over 500,000 volumes. The transfer of Königsberg to the U.S.S.R. was agreed at the Potsdam conference, Aug., 1945. Pop., pre-war, 316,072.

Kalinjar. Town of India, in Banda district, Uttar union. The town and fort are of great antiquity, and the site contains archaeological remains.

Kalisz. A town of Poland, in the co. of Lodz. It stands on the Prosna, 135 m. W.S.W. of Warsaw. There are woollen, cloth, linen, and glove factories, and considerable trade in lace and embroidery. An R.C. bishop has his see here. One of the oldest towns in Poland, it has been identified with the ancient Calisia in the land of the Suevi. The Swedes were defeated by the Poles in a battle in the neighbourhood, Oct. 29, 1706. Kalisz was captured by the Germans in their invasion of Poland early in the First Great War, was retaken by the Russians, again lost, and suffered serious damage. In the Second Great War it was in German-occupied Poland and fell to Marshal Zhukov's White Russian army Jan. 24, 1945, in its rapid winter advance. Pop. 68,300. *Pron.* Kalish.

Kalk Bay. Seaside resort of Cape prov., South Africa. It is 17 m. by rail S. of Cape Town and situated on False Bay.

Kallio, KYÖSTI (1873–1940). A Finnish statesman. Born April 10, 1873, of peasant extraction, Kallio entered politics in 1904 and rapidly attained distinction, being minister of agriculture 1919–1922. He was thrice president

between 1921 and 1930. Elected again in 1937, he attended the four-power conference at Stockholm in 1939 to discuss the Russian demands on Finland. When he decided to retire Risto Ryti was on December 19, 1940, elected president, and that same night Kallio died of heart failure at Helsinki station.

Kalmar. A län or county of Sweden. It forms part of Gothland and has a long coastline on the Baltic Sea and Kalmar Sound. The stormy winds and rapid streams provide wind and water power for beet sugar and cement factories. Its area is 4,456 sq. m. Pop. 231,316.

Kalmar OR CALMAR. A seaport of Sweden, in the län or govt. of the same name. It stands on Kalmar Sound, partly on two islands and partly on the mainland, 189 m. S.S.W. of Stockholm, the sea passage being 217 m. It has a large 12th century castle, a 17th century cathedral, and a museum. It has a good harbour, and there are extensive shipbuilding yards near. The manufactures include matches, chicory, tobacco, paper, and stoves. Here on July 20, 1397, was signed the Kalmar Union, by which

central Asia to Europe, begun in 1616, are still represented by over 150,000 Kalmucks inhabiting the southern Astrakhan steppe. They have partly abandoned nomadic life, but maintain their ancestral lamaism, with over 60 monasteries. There are some 15,000 in the Caucasus. Under Catherine II of Russia, an immense horde undertook in 1771 a reflex migration, 300,000 being reputed to have reached the Zungarian homeland, where they recruited the Mongol population, reduced by Chinese massacre in 1758. Six central Asian tribes now occupy a northern region in Sinkiang and Kulja, besides a southern region in Alashan, Kokonor, and N. Tibet.

Kalmuck was the name of an autonomous republic of the U.S.S.R., overrun by the Germans in 1942. It was dissolved in 1946, and divided between the Stalin-grad, Rostov, Stravopol, and Astrakhan regions of the R.S.F.S.R., when its former capital Elista or Yelista was renamed Stepnoi.

Kalna. A subdivision and town in India, in Bardwan district, Bengal. Its area is 386 sq. m. Kalna town is on the Bhagi-rathi river, and was once a

trade centre of importance. Pop., subdivision, 247,672; town, 12,562.

Kalnoky, GUSTAV SIEGMUND, COUNT (1832-98). An Austro-Hungarian statesman. Of distinguished Transylvanian family, he was born at Lettowitz, Moravia, Dec. 29, 1832. Entering the diplomatic service in 1854, he served in Munich and Berlin before becoming secretary to the London embassy, 1860-70. During 1874-79 he was minister at Copenhagen, and after a brief period as ambassador at St. Petersburg (Leningrad), became foreign minister. He laboured to improve relations between Austria and Russia, and in 1882 engineered the triple alliance of Austria, Germany, and Italy. Resigning 1895, he died Feb. 13, 1898.

Kalocsa. Town in Hungary. It is in the co. of Pest-Pilis-Solt-Kiskun, 86 m. by rly. S. of Budapest, near the left bank of the Danube. Like other Danubian towns, it is well back from the river, but has steamer communication with Budapest. The seat of an archbishop, it has religious edifices as principal buildings. Pop. 11,877, nearly all Roman Catholic Magyars.



Kalmuck. Mongol peasants from Russian Central Asia

Kalpi. A subdivision and town in India, in the Jalaun district, Uttar union. Its area is 405 sq. m., one-third under cultivation. Kalpi town is

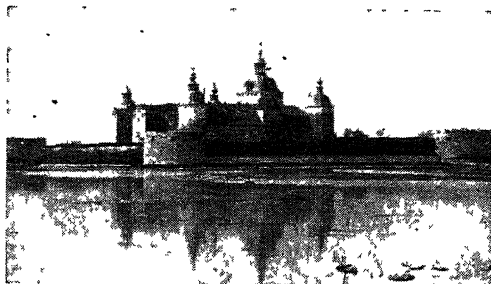
a trade centre of importance. Pop., subdiv., 94,880; town, 12,600.

Kaluga. Town of R.S.F.S.R., in the region of the same name. It stands on the left bank of the Oka, about 100 m. S.W. of Moscow on the rly. to Briansk. It therefore figured in the fighting of the Second Great War, the Germans taking it on Oct. 16, 1941, to lose it again on Dec. 30. First mentioned in 1389, it has several times been destroyed by fire. Industries are sawmilling, cloth making, and those connected with leather and tallow. Trade is done in oil, grain, and fruit. The region is not fertile, but contains coal and iron. Pop. of town, 89,484.

Kama. In Hindu mythology, the god of love. Endowed with perpetual youth and surpassing beauty, he exercised sway over both gods and men; his weapons were blossom-tipped arrows shot from a flowering bow.

Kama. A river of European Russia. Rising in Udmurt A.S.S.R. it flows N., E., S., and W. across the Tatar A.S.S.R. to join the Volga 40 m. below Kazan after a course of about 1,000 m. It forms one of the chief means of communication between Siberia and Gorky, and is connected with the Dvina basin by canal. It is navigable to Perm from May to Oct. The transport of timber is considerable.

Kamakura. Historic site in Japan, 12 m. S.W. of Yokohama. During the 13th and 14th centuries the city contained about 750,000 inhabitants, and was the capital of the Shogunate. The existing town on the site has numerous shrines visited annually by thousands of tourists. The chief shrine, that of



Kalmar. The 12th century castle, scene of many notable events in Swedish history

the crowns of Denmark, Sweden, and Norway were united for over a century. Pop. 24,385.

Kalmar Sound. Narrow strait in the Baltic Sea. It separates the island of Öland from the S.E. coast of Sweden. Its length is 90 m.

Kalmia. A genus of evergreen shrubs of the family Ericaceae. It consists of six species, five natives of N. America and one of Cuba. They have undivided, leathery leaves, naked leaf-buds, and showy flowers. The flowers are remarkable for their mechanism connected with insect pollination. The name was given by Linnaeus in honour of his pupil Peter Kalm, 1715-99. See American Laurel.

Kalmuck. Western branch of the Mongol stock. Migrations from

Hachiman, is dedicated to the emperor Ojin-Tenno, popularly called the God of War. The colossal bronze image of Buddha, Daibutsu, is 50 ft. high, and 36 ft. from knee to knee; windows in the shoulders, to which access is gained from the hollow interior, overlook the surrounding scenery. The statue is rivalled throughout Japan only by the similar gigantic image of Nara. Tidal waves washed away structures that formerly enclosed the Daibutsu, which has remained unsheltered since 1494.

Kambove. A settlement in the Belgian Congo. It is 2,400 m. N. of Cape Town by rly. and 220 m. S. of Bukama, where the navigable portion of the Congo commences. It is the centre of a great copper-mining district.

Kamchadal OR **KAMCHATKAN.** Tribe of palæo-Asiatic stock in the Kamchatka peninsula, E. Siberia. Calling themselves Itelme, and numbering a few thousands, they present both Mongoloid and Amerind traits, and are now largely Russified in speech and religion. They hunt bear for food, clothing, and implements, spear salmon, eat birch bark, use dog sledges, and inhabit winter earth-huts and summer pile-dwellings.

Kamchatka. Peninsula in E. Siberia, part of the Far Eastern region of the R.S.F.S.R. It is bounded by the sea of Okhotsk, and the Arctic and Bering seas. There are numerous extinct and active volcanoes; earthquakes are frequent. There are important fisheries, and trade in furs. The natives are chiefly engaged in hunting and fishing, but there are state farms for cattle breeding. Grain and potatoes are grown. Kamchatka has belonged to Russia since 1706. Area, 69,711 sq. m.

Kame. In geology, hillock or irregular ridge formed by outwash material (sand or gravel) from a glacier. Kames probably originated as a series of deltas of which one side was supported by the front of the ice-sheet. As they developed they would link up laterally, and when the ice retreated or melted, the kame ridge was left parallel to the former ice margin. Kames are similar to terminal moraines, except that the former are deposited from streams and the latter are masses of rock or clay dumped by the ice.

Kamehameha. The name of several kings of the Sandwich Islands. Kamehameha I (1753-1819), called the Great, the son of a chief, made himself ruler of the western part of Hawaii in 1781.

Later he made himself king of the whole of the islands. During his reign, facilities for trade with Europeans were given, and he did something in an attempt to put down human sacrifices. Kamehameha II died in London, on July 14, 1824, while on a visit to George IV. See Sandwich Islands.

Kamenets-Podolsk. Town in the extreme W. of Ukraine S.S.R. and headquarters of a region. It was formerly a Polish stronghold against the Turks, who occupied it from 1672 to 1699, when it was restored to Poland. It was incorporated with Russia in 1795. The R.C. cathedral dates from 1361 and the Greek cathedral from the 16th century. Captured by German forces in July, 1941, the town was liberated by the Russians March 26, 1944. The region presents a mixed scene of industry, agriculture, and cattle raising.

Kamenz. Town of E. Germany, in Saxony. It stands on the Black Elster in Ober-Lausitz, 20 m. N.E. of Dresden. Cloth, earthenware, and glass are manufactured. There are three mediæval churches. The poet Lessing was born here in 1729. Pop. 13,730.

Kames, HENRY HOME, LORD (1696-1782). Scottish lawyer and philosopher. The son of George



Lord Kames,
Scottish lawyer

Home, he was born at Kames in Berwickshire, and began work in a lawyer's office in Edinburgh. In 1724 he became an advocate. In 1752 he was made a judge of the court of session, taking his title, and in 1763 he was promoted to be a lord of judicatory. He died Dec. 27, 1782. Kames made a great reputation as a philosopher, especially by his essays on the Principles of Morality and Natural Religion, 1751. He also wrote Elements of Criticism, 1762, and a book on agriculture, The Gentleman Farmer, 1776. Noted for rough and ready wit, on sentencing to death for murder a chess opponent, Matthew Hay, he said, "That's checkmate for you, Matthew."

Kamet. Mt. peak of the Himalayas. On the frontier of Tibet and the United Provinces of India, it attains an alt. of 25,447 ft.

Kamharsain. A former small state of the Punjab, India, now part of the Himachal union. The area tilled is small and yields wheat

and pulses. The rainfall is 60 ins. Area, 90 sq. m. Pop. 12,781, nearly all Hindus.

Kaministikwia OR **KAMINISTIGUIA.** A town and river of W. Ontario, Canada. The town is on the river of the same name 21 m. by rly. W. of Fort William on the main line of the C.P.R. In the dist. are extensive occurrences of silver and zinc ores. The fur traders' route led from Thunder Bay, Lake Superior, up the Kaministikwia to the Lake of the Woods.

Kamishin. Town of R.S.F.S.R. It is in the Stalingrad region, 100 m. S. by W. of Saratov, on the Volga. The dist. is exceedingly fertile, and its water-melons are famous. Kamishin is one of the most important marts and places of shipment on the Volga, and does a brisk trade in salt and grain. From it a rly. goes to Moscow.

Kamloops. A city of British Columbia, Canada. It is 250 m. N.E. of Vancouver and 390 m. W. of Calgary, standing where the N. and S. Thompson rivers unite at the E. end of Kamloops Lake. It is a junction on the C.P.R. and also served by C.N.R. It is the centre of a mining, fruit growing, and grazing district in a dry belt. The city has public parks, churches, schools, etc., while near is an Indian reservation, with an Indian village. Built on the site of a fort established by fur traders about 1800, Kamloops became a corporate town in 1892. Pop. 6,750.

Kammin OR **KAMMIN.** Town of Pomerania, in the area placed under Polish administration in 1945 in accordance with the Potsdam agreement. It stands on a lake, 2½ m. from the Baltic, with which it is connected by river, and 38 m. N. of Stettin. It has several churches, one being the former cathedral, a 13th century building. Kammin was from about 1200 to 1628 the seat of a bishop.

Kampala. A town of Uganda. The capital and commercial centre of Buganda and residence of its ruler, it lies 25 m. N. of Entebbe on Lake Victoria and has rly. connexion with Namasagali and Mombasa. There are European banks and a government college. See Mengo.

Kampen. Town of the Netherlands, in the prov. of Overijssel. It stands on the river Yssel, 8 m. by rly. W.N.W. of Zwolle; the river is navigable for small craft, and from Kampen there is steamboat communication with Amsterdam, Enkhuizen, and Zwolle. In earlier times Kampen was a port and a member of the Hanseatic

League (*q.v.*), but harbour silting made it of minor importance. The Stadhuys, built in the 14th century and restored in 1543 and 1915, is a notable building, with fine carvings in the council chamber. There are engineering works and brickworks. Pop. 22,177.

Kamperduin. A village of the Netherlands, in the prov. of N. Holland. It lies among the dunes on the coast 27 m. N.W. of Amsterdam, and is best known as the scene of the naval battle of Camperdown (*q.v.*), an Anglicised form of the name.

Kamrup. A dist. in Assam, India. Its area is 3,840 sq. m., about a quarter of which is under cultivation, rice being the chief crop. Exports include tea and timber, imports piece goods, hardware, and oil. Pop. 1,264,200.

Kanagawa. Suburb of Yokohama, Japan. Before 1871, when Yokohama was a small fishing village, Kanagawa was an important town on the national highway to Tokyo. The earliest treaties of commerce and navigation between Japan and foreign countries were signed here, and the harbour of Kanagawa was the original open port. The harbour now lies N. of the newly constructed port works of Yokohama. Kanagawa is separated from Yokohama by the Katabira river. It suffered severely in the earthquake of 1923.

Kanaka. Aboriginal people of Polynesian stock living in the Hawaiian Islands. They may number some 20,000, not counting part-Hawaiians, and are tall, stalwart, and brown. The men furnished crews for the early South Sea whalers, who introduced the native name. French usage extended it to other Pacific islanders, including the dark Melanesians of New Caledonia. Hence, generally spelled as a common name, it came to denote the coloured labourers, mostly Melanesians from the Solomons and New Hebrides, who were recruited for the Queensland sugar plantations. Brought under regulation in 1880, these were repatriated in 1906, except



Kanaka man from Hawaiian Islands

for some who were permanently settled. *Pron.* kannaka; but in Australia, kanakka.

Kananur. Coast town of India, in the Malabar dist. of Madras, better known as Cannanore (*q.v.*).

Kanara. Two coast districts in India, known as N. Kanara and S. Kanara. The former is in the southern division of Bombay and is crossed by the Western Ghats. Area, 3,961 sq. m. About three-quarters is forest land, and the cultivated area is only about one-eighth. The mineral resources include iron ore and building stone. Exports are rice and timber; imports piece goods and metals.

S. Kanara is on the W. coast of Madras, and lies between the Western Ghats and the sea. Area, 4,045 sq. m., of which about a quarter is forest, and a quarter is under cultivation, rice being the chief crop. The industries include tile-making. Among exports are coffee, rice, and tiles; imports include piece goods. The dist. has important Jain remains. Pop., North, 1,373,466; South, 1,523,516.

Kanarese or **CANARESE.** Agglutinative speech of the Dravidian language-family spoken in Mysore, Hyderabad, and adjacent S. Indian districts. It is spoken by perhaps ten million persons in India, and a few in Ceylon, and is represented by 6th century Bijapur inscriptions and by a prolific literature, 850-1600. Kanarese-speaking peoples are dark-skinned, medium-headed, volatile, cultivators and traders. See Dravidian.

Kanaris, CONSTANTINE (1790-1877). Greek patriot. Born on the island of Ipsara, he joined the national party in 1822, and twice (off Chios and Tenedos) attacked the Turkish fleet with fireships, blowing up the flagship. Two years later he made a successful fireship attack on Samos and Mitylene. He was largely instrumental in deposing Otto from the throne of Greece, and during 1864-65 was prime minister under his successor, George. He was holding office when he died, Sept. 15, 1877.

Kanauj. Town in Farrukhabad dist., Uttar union, India. It is of great antiquity, and near are many archaeological remains. Pop. 21,994. The town gives its name to a sub-division.

Kanawha or **GREAT KANAWHA.** River of the U.S.A. Rising between the Blue Ridge and Iron Mts., part of the Appalachians, in the N.W. of North Carolina (in which state it is called the New River), it flows N.E. through Vir-

ginia and then N.W. through West Virginia, meeting the Ohio at Point Pleasant. From its junction with the Gauley in W. Va. to its mouth, it is called the Great Kanawha. It is 450 m. long, drains 20,200 sq. m., and has been made navigable from Great Kanawha Falls to its junction with the Ohio. Part of the territory through which it flows is rich in salt, coal, and iron. See Appalachians.

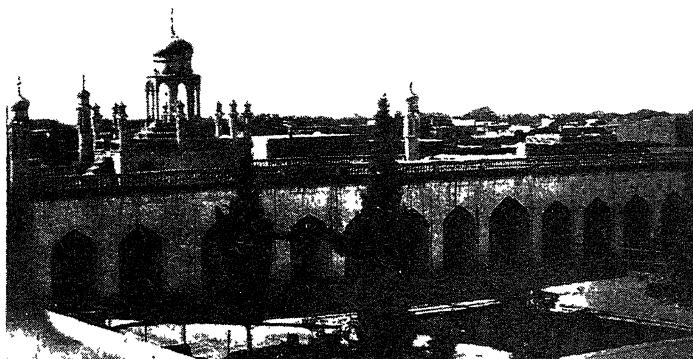
Kanazawa. Town of Japan. It is situated near the W. coast, on the coast rly., 41 m. S.W. of Nanao. The city, which is on a narrow coastal plain, has declined in prosperity since the abolition of feudalism in 1871; it is the centre of a prefectural administration. Pottery and lacquer ware are manufactured. The castle, dating from 1583, was destroyed by fire in 1881; its grounds are a military headquarters. The town was damaged by the great earthquake of June 28, 1948 (see Fukui). Pop. 163,733.

Kanchow. Town in the N.W. of Kansu prov., China. One of the two towns (Kanchow and Suchow) from which the prov. takes its name, it is a stage on the route from Peking to Kashgar. Sand from the Gobi desert has much encroached upon the district. The Great Wall runs to the E. and N.

Kandahar. City of Afghanistan and capital of the prov. of the same name. Four-sided in form, it is traversed by four main streets, and surrounded by a ditch 24 ft. wide, 10 ft. deep, and by a mud wall 27 ft. high, 20½ ft. thick at base, and 14½ ft. at top. There are four main gates, Herat, W.; Kabul, E.; Shirkarpur, S.; Idgah, N.; and two minor gates, Bar Durani, E.; Top Khana, W. The gates are defended by six double bastions, and the angles by four circular towers. The square citadel is N. of the city, a dominating feature of which is the octagonal tomb of Ahmed Shah Durani, with gilded dome. Lying nearly 300 m. S.W. of Kabul, Kandahar is on a level plain between the Argand and Tarnak rivers, and each of the four main streets, named after the gate to which it leads, is 40 yards wide, bordered with trees, and flanked by shops and houses. The houses generally are of sun-dried bricks, with flat roofs. The city, which is divided into districts in occupation of different tribes, is strategically important as one of the three great cities of Afghanistan and the "key to India." Meshed, in N.E. Persia, Herat, Kandahar, and Quetta are almost in a



Constantine Kanaris, Greek patriot



Kandahar. General view of the capital city of Afghanistan, showing the Government Palace in the foreground

direct line with the Russian Trans-Caspian rly. and the Baluchistan rly. from Chaman through Quetta to the Indus valley at Jacobabad. In the Afghan Wars (*q.v.*) Kandahar was occupied by the British in April, 1839, and was successfully defended in 1842 by General Nott. Lord Roberts occupied it in 1879-80, after his great march from Kabul; he took his title from the city. Pop. 77,000. See Afghanistan; Roberts, Lord.

Kandalaksha. A gulf in N. Russia. It is in the White Sea, between the peninsula of Kola and the Karelo-Finnish S.S.R., and is 125 m. long and 50 m. wide

The fishing town of Kandalaksha is at the N. extremity of the gulf. One of the places developed under the five-year plans, it is linked by rail with Leningrad and Murmansk, and with Kuolayarvi in Finland. This last line helped the Russians in 1941 to resist Finnish-German forces. Iron occurs near the town.

Kandavu. Southernmost of the Fiji Islands. It is separated from Viti Levu to the N. by Kandavu Passage. Shaped like a shoe, it is 35 m. in length. The interior is mountainous; at the W. end Mt. Washington is an extinct volcano, 2,750 ft. In some respects it is the most fruitful and beautiful of all the islands of the archipelago. Area: 209 sq. m. See Fiji Islands.

Kandinsky, WASSILY (1866-1944). Russian painter. He worked in Paris, and after experimenting with Cubism before the First Great War, became a leading painter of the non-representational school. His designs were geometrical and his use of colour strictly disciplined by symbolist theories. In his later work he resembled Klee (*q.v.*). A retrospective exhibition of his paintings was shown in New York in 1945.

Kandy OR CANDY. TOWN of Ceylon (*q.v.*). It is situated at an elevation of 1,660 ft. on a mt. lake, 75 m. by rly. N.E. of Colombo. Once capital of the native kingdom of Kandy, it was annexed by Great Britain in 1815, and is notable for its royal tombs and temples, including that containing a reputed tooth of Buddha. The gov.-gen. has a residence at Kandy, which was the headquarters of S.E.A.C. in the Second Great War, April, 1944-Nov., 1945. Pali and Sanskrit MSS. have been discovered here. The botanical gardens of Peradenia, 3 miles distant, are a modern feature. Local products include tea, cocoa, coffee, cinchona, pepper, vanilla, and areca nuts. Pop. 52,000.

Kane, ELISHA KENT (1820-57). American explorer. Born at Philadelphia, Feb. 3, 1820, he graduated



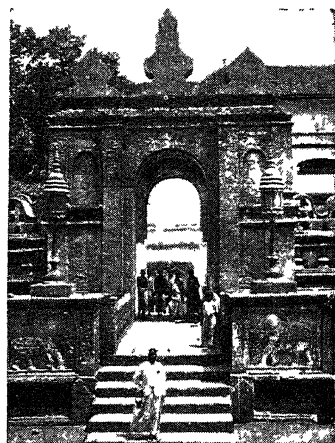
Elisha Kent Kane, American explorer

in medicine in 1842, and became assistant surgeon in the navy. In 1850 he accompanied Grinnell's expedition attempting to rescue Franklin, and was thus inspired with the idea of Arctic discovery. In 1853 he commanded the *Advance*, sailed to 78° 43' N. in Smith Sound, discovered the Humboldt glacier, and in 1854 reached Cape Constitution, 80° 35' N. Abandoning the *Advance* in 1855, the party made their way back in small boats. Kane died at Havana, Feb. 16, 1857.

Kane, SIR ROBERT JOHN (1809-90). Irish scientist. Born in Dublin, Sept. 24, 1809, he was educated at Trinity College there and became a doctor. In 1831 he was made professor of chemistry at the

Apothecaries Hall. He founded the Dublin Journal of Medical Science, and during 1834-47 was professor of natural philosophy to the Royal Dublin Society. Secretary to the Royal Irish Academy and an editor of *The Philosophical Magazine*, he did much to develop Irish industries, the museum of Irish industries in Dublin being founded at his initiative. During 1845-73 he was president of Queen's College, Cork, after which he was a commissioner of national education. In 1846 he was knighted and in 1877 was president of the R.I.A. He died Feb. 16, 1890.

Kanem. Country of Africa. It lies in French territory to the N. and E. of Lake Chad. At one period it occupied a position of

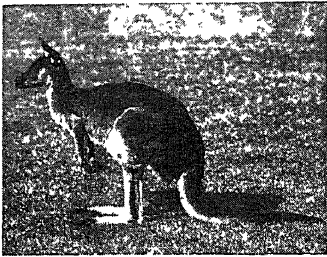


Kandy. Entrance to the Buddhist temple of the Sacred Tooth

great importance in the Sudan and spread to the borders of the Nile in the E. and to Fezzan in the N. Under Muslim rulers, Kanem, whose history goes back to the 11th century, entered into close relations with Egypt and the Barbary states. About 1380 the capital was removed to Bornu, and the Kanuri then adopted the present Bornu as their own kingdom.

Kangaroo (*Macropus*). Genus of marsupial or pouched mammals found only in Australasia and New Guinea. They are characterized by long hind legs and powerful tails on which they partly rest the body. The tapering head is small in proportion to the bulk of the body, and the ears are prominent and erect. The fur may be red, grey, or blackish. There are a large number of species, the largest measuring 5 ft. in length of body with a tail over 4 ft. long, and a weight of about 200 lb. The smallest is the size of a rabbit.

Kangaroos feed on grass and herbage and roots which they dig up. Found always in companies,



Kangaroo. Great Red Kangaroo, largest of the pouched mammals of Australia
Gambier Bolton. F Z S.

they do not wander far from their regular feeding grounds, grazing during the night and resting during the day among the scrub in the valleys. In the neighbourhood of farms they often ravage the fields of young corn. When not disturbed they move along like rabbits, but if alarmed they make off at great speed, covering as much as 10 yds. at a bound.

As in all the marsupials, the young kangaroo is born in a small and rudimentary condition, and directly after birth is placed by the mother in her pouch, where it adheres with its mouth to the teat.

When fully developed it begins to emerge and crop the grass, but at the slightest alarm it returns to the maternal pouch, where it sleeps. Only a single young one is produced at a birth.

Kangaroos are timid and inoffensive, making off at once if approached, and it requires a powerful horse or dog to run one of them down. But when cornered they are dangerous opponents, as they can inflict terrible wounds with the sharp claws of their powerful hind feet. The herds are always led by an old male, whom they follow with the greatest pertinacity. They have been known to take to the water when pressed, and even to swim across an inlet of the sea.

The kangaroo is of some economic importance, as a flexible leather made from its skin is suitable for gloves and light shoes, while the flesh is esteemed for the table, the tail being considered a delicacy.

Kangaroo. Island off the coast of S. Australia. It is 87 m. long, and its area is about 1,600 sq. m. The N.E. is best for agriculture, as the land is covered with glacial clay; the W. and S. are sandy. Salt deposits are worked. Here Baudin's expedition left an inscription

at Hog Bay in 1803. The first party of S. Australian pioneer emigrants landed in 1836, although Whalley made the first individual settlement in 1816.

Kangaroo Apple (*Solanum aviculare*). A shrub of the family Solanaceae. A native of Australia and New Zealand, it has lance-shaped leaves and violet flowers in short sprays. The large green or yellow fruits are eaten when ripe, but until then are acrid.

Kangaroo Court. An organization operating in many prisons in the U.S.A., ostensibly as a means of prisoners' self-government. The courts have no official status, but are usually approved by the gaolers, their rules being enforced by fines and physical punishments. Trials held in lawful courts have brought to light cases in which young prisoners have been beaten and even tortured because they refused to comply with the demands. Kangaroo courts have been repeatedly condemned by federal gaol inspectors, who have no power to interfere, as the prisons concerned are under state and not federal jurisdiction.

Kangaroo Grass (*Anthistira vulgaris*). Perennial grass of the family Gramineae, native of Australia, where it is the prevailing herbage in many tracts known as



Kangaroo Grass. Australian herb of great value in cattle raising

rich grass country. It is of great value to the cattle raising industry in both Australia and S. Africa.

Kangra. A district, subdivision and town in Jullundur division, Punjab, India. The dist. consists of a S.W. section drained by the rivers Kangra and Beas, known as Kangra proper, and a mountainous N.E., the areas of Lahul, Spiti, and Kulu, where rain rarely falls and snow lies for many months. Its area of 9,979 sq. m. makes it the largest dist. in the Punjab.

Kangra proper is 2,939 sq. m. in area, less than one-third culti-

vated, chiefly for wheat, maize, and rice. The subdivision occupies part of the rich and beautiful



Kangaroo Apple. Foliage and flowers; inset, cluster of fruit, also section

Kangra valley. The administrative centre of Dharmasala; the former capital of the raja, Kangra town has declined under British occupation. The latter, formerly known as Nagarkot, contained an historic temple and fort destroyed by earthquake in 1905. The people are nearly all Hindus. Pop., dist., 899,377.

Kanizsa. The common name of three towns all formerly in Hungary. Nagy-Kanizsa (*nagy*, great) is still Hungarian. It is an important rly. junction, 139 m. S.W. of Budapest, in Zala co., between Lake Balaton and the river Mur. Once an important fortress, and a royal free town, it has manufactures of spirits, etc. The people are mostly R.C. Magyars.

Magyar-Kanizsa and Török-Kanizsa (Török, Turkish) are on opposite sides of the Tisza (Theiss) in Yugoslavia, N. of Zenta. Both are connected by rly. with Szeged in Hungary.

Kankakee. A city of Illinois, U.S.A. The co. seat of Kankakee co., on the Kankakee river, it is 56 m. S.S.W. of Chicago on the Illinois Central and other rlys. The river, here spanned by a fine bridge, supplies water power for manufactures of textile machinery, agricultural implements, furniture, and office supplies. There are foundries, rly. repair shops, and manufactures of bricks and tiles. This is a trading point for the Illinois corn belt. The central high school has 45 sculptures by G. G. Barnard. Settled in 1832 and laid out in 1853, Kankakee was originally an extension of Bourbonnais, and was incorporated in 1855. Pop. 22,241.

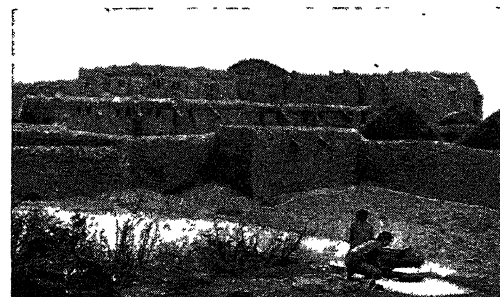
The river Kankakee joins the Des Plaines to form the Illinois.

Kanker. State of central India, now part of the Madhya union. Lying N. of Bastar, the country is hilly and infertile, yielding few crops except for the rice and native grains cultivated in the valley of the Mahanadi in the E. Most of the people are Gonds. Area, 1,413 sq. m. Pop. 149,471.

Kannapolis. Unincorporated town of North Carolina, U.S.A. In Cabarrus co., 29 m. E. of Charlotte, it is served by the Southern rly. The town is owned by Cannon Mills, the world's largest producers of household textiles. J. W. Cannon built the town in 1906. Pop. 12,661.

Kano. City in the Northern Provinces of Nigeria. Situated at an alt. of 1,567 ft. above sea

level, it is an important trading centre, and is connected by rly. with Iddo, 704 m. distant to S.W. The chief products are hides and ground nuts, and native manufactures are silks, cotton, and leather goods, especially those commercially known as morocco leather. There was at one time a considerable traffic with Tripoli across the Sahara. The city is surrounded by a high wall and a deep double ditch. The palace of the ameer covers an area of about 30 acres. Powerful under the Fula slave raiders, Kano was taken in 1903 by a British force, when the district round it was organized under a friendly ameer. Pop. 89,812.



Kano, Northern Nigeria. Palace of the ameer; it is situated in the Fula quarter in the S.E. of the city.

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Kanopolis Dam. Flood control scheme in Kansas, U.S.A. The dam, which is 125 ft. high and has a length of 15,400 ft. at its crest, contains 9,860,000 cu. yds. of material and impounds the Smoky Hill river.

Kansas or **KAW.** River of Kansas, U.S.A. Formed by the union of the Republican and Smoky Hill, it flows generally E. past Topeka and Laurence to join the Missouri at Kansas City on the E. border. It receives the Big Blue, Saline, and Solomon rivers, and

has a length of 600 m. reckoned from the source of the Smoky Hill. The system drains 61,000 sq. m. The Kansas can take slow freight, being navigable by barges for 9 m. from its mouth.

Kansas. A state of the U.S.A., situated at practically the exact geographical centre of the country. Mainly an undulating prairie, the surface rises from 750 ft. in the E. to 4,000 ft. in the N.W. Its area is 82,276 sq. m. The principal navigable river is the Missouri, forming one-third of the E. boundary, others being the Arkansas and Kansas. The state lacks any really navigable rivers within its borders, and relies on rly. transport. It is liable to drought, tornadoes, blizzards, and

floods, but by careful irrigation has attained fourth position among the wheat-producing states.

It is one of the leading cattle-raising states and is noted for its dairy products, poultry, and maize. In the W. where crops do not grow well there is fodder for the millions of

cattle and pigs required by the meat-packing industry. Other products include barley, hay, rye, flax, potatoes, sugar beet, and fruit. Together the two towns named Kansas City lead the world as markets for livestock, hay, and winter wheat, and rank second only to Chicago as slaughtering and meat-packing centres.

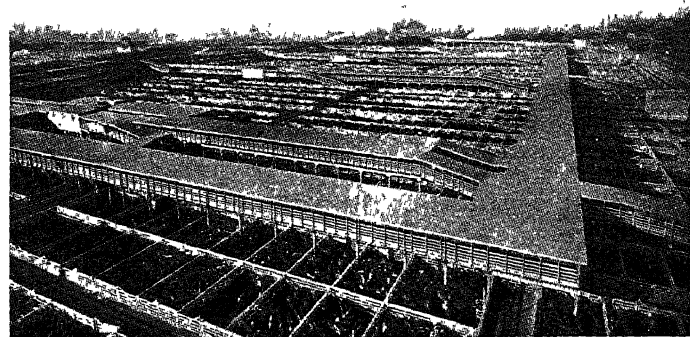
Mining flourishes, coal, salt, zinc, lead, limestone, natural gas, and petroleum being worked. Other industries include manufactures of steel, aeroplanes, motor

cars, agricultural machinery, and Portland cement. There are a university and four other educational institutions maintained by the state, and the largest Indian school in the U.S.A. The railways comprise 8,712 m. of lines, Kansas City being a great rly. centre. The state returns two senators and six representatives to congress. Made a territory in 1854, it was admitted to the Union in 1861. Total prohibition was in force 1880-1949. Topeka is the cap. Pop. 1,801,028. *Consult* History of Kansas, W. E. Connelley, 1928.

Kansas City. City of Kansas, U.S.A., the co. seat of Wyandotte co. At the junction of the Kansas and Missouri rivers, 62 m. E. of Topeka and opposite Kansas City in Missouri, it is the largest city in the state and is served by 12 rlys. and an airport. It shares rly. stations, tramways, and telephone systems with its neighbour, and the majority of industrial plants and stockyards customarily included in surveys of Missouri are on the Kansas side. Its commercial activities are interrelated with those of its sister city.

It is the seat of the Western university for negroes, and contains also theological and medical colleges, and a conservatory of music. In Huron Park is a burial ground "perpetually reserved and appropriated" by the Wyandot Indians, who bought land here in 1843, making the first settlement. In 1869 a town was founded, and in 1880 began the series of consolidations of eight towns, which ended in 1922 with the establishment of the present city. Pop. 121,458.

Kansas City. City and port of entry of Missouri, U.S.A., in Jackson co. The second largest city of the state, it is situated on the right bank of the Missouri river opposite Kansas City in



Kansas City, Kansas. Stockyards in this industrial city which lies at the junction of Kansas and Missouri rivers, opposite Kansas City in Missouri



Kansas City, Missouri. General view of the city, showing its skyscraper commercial buildings, and, in the foreground, Union Station

Kansas. The city occupies three altitudes, the highest containing the residential quarter, and the lowest most of the factories and business houses. It owes its eminence to its position in the great bend of the river and to the enterprise of the early settlers in welcoming rlys., which factors have helped to make it a continental crossroads and the market for most of the West. It is served by 12 major rlys., three rly. bridges spanning the Missouri, and an airport.

The city is one of the world's largest livestock markets and ranks next to Chicago as a slaughtering and meat packing centre. It is the world's biggest hay market and distributing centre for seeds and agricultural implements. Its grain storage facilities are unequalled, and the fabricated steel plants are the largest W. of the Mississippi. The chief products include motor cars, iron and steel goods, flour, soap, chemicals, and rubber goods. There are also oil refineries. Over 5 sq. m. of public parks and several art galleries and museums are maintained. Settled in 1821, the town was incorporated in 1850. Originally known as Westport Landing, it was renamed in 1853, and was rechartered in 1875, 1889, 1908, and 1925. Pop. 399,178.

Kansu. N.W. province of China. Shaped like an irregular dumbbell, it has an area of 151,161 sq. m. and contains 166 counties with Lanchow as its capital. Other important cities are Kanchow and Suchow (which give the prov. its name) and Tienshui. Lanchow is the projected terminus of the Lunghai rly. from the E. coast. The W. extremity of the Great Wall is near Suchow, where the prov. becomes a strip, nowhere more than 100 m. wide, enclosed between the Nanshan Mts. and the Gobi Desert. The average alt.

here is 5,000–6,000 ft. Kansu is watered by the Hwang-ho and Wei-ho. Products include wheat, tobacco, wool, leather, coal, and oil.

Kansu is of historic significance as the earliest outlet to the west through the famous Jade Gate Pass in the Kunlun Mts. It was the scene of a Mahomedan revolt, 1861–77. On Dec. 16, 1920, an earthquake created havoc in the S.E. between Lanchow and the Wei-ho, killing 180,000 people. Another earthquake, on Dec. 26, 1932, caused 70,000 deaths. One of the least densely settled provinces of China, Kansu has a pop. of 6,256,000, including many Mahomedans.

Kant, IMMANUEL (1724–1804). A German philosopher. Born at Königsberg (now Kaliningrad),



April 22, 1724, the son of a saddler of Scottish descent, he studied classics, physics, and mathematics at the university, and there was professor of logic and

metaphysics from 1770 until 1797, when old age compelled him to discontinue his lectures. His long life, regulated with clockwork precision, was absolutely uneventful. He never married, was never more than 40 miles from his native town, and died there Feb. 12, 1804.

Kant's great service to philosophy was his endeavour to find a bond of union between realism (materialism) and idealism, each of which had claimed to be the only true system. The former regarded matter, the latter mind (the Ego), as the absolute; the former regarded the Ego as entirely dependent on the world of sense; the latter, as entirely independent of it. Kant, while admitting that experience alone furnishes us with the matter of knowledge, asserts that there exist *a priori* (q.v.) in the mind certain notions independent of experience, ready to be applied to the matter furnished by experience. The three great works in which he investigates the nature, limits, and extent of human knowledge are *Critique of Pure Reason*, 1781; *Critique of Practical Reason*, 1788; *Critique of Judgement*, 1790. The *Prolegomena* to every future *Metaphysic*, 1783, embodies the main ideas of his system.

Kant first undertakes the criticism of pure reason. The chief propositions of his theory of knowledge are the following. We cannot know things as they really are, but only as they appear to us, since they are modified by the categories (q.v.), and by passing through the medium of space and time. Experience alone supplies us with the material of knowledge and it is impossible, by the exercise of thought, to attain to the knowledge of anything beyond such material. If we make the attempt we are at once involved in contradictions. His conclusion is that the three ideas of reason—of the soul as a thinking substance, of the world as the totality of all phenomena, of God as the absolute all-perfect being—have no objective value, but only possess reality in the mind which conceives them. This is the negative result of the investigation, leading apparently to scepticism.

Here practical reason steps in. If theoretical reason, in the matter of knowledge, is conditional and controlled by experience, practical reason transcends, goes beyond experience. Certain truths which theoretical reason denied or was unable to prove—the immortality of the soul, the freedom of

the will, the existence of God—are established by the principles of practical reason. The Critique of Judgement deals with the sublime and the beautiful (aesthetic judgement) and the order of nature (teleological judgement). These judgements are a kind of middle term between pure and practical reason.

Bibliography. Works, ed. E. Cassirer, 10 vols., 1912–22; Life and Doctrine, F. Paulsen, Eng. trans. 1902; Kant, W. Wallace, 1905; Lectures on the Philosophy of Kant, H. Sidgwick, 1905; Commentary to Kant's Critique, N. K. Smith, 1927; I. K. in England, 1793–1838, R. Wellek, 1932; Introduction to Kant's Critique of Pure Reason, T. D. Weldon, 1945; Kantian Studies, A. H. Smith, 1947.

Kantémir, ANTIOCHUS DMITRIÉVITCH (1709–44). A Russian satiric poet. A Moldavian prince, son of Demetrius Kantémir, and born Sept. 21, 1709, in Constantinople, he adopted Russia as his country. His first satire, against the opponents of education, appeared in 1729. In 1730 he was appointed Russia's diplomatic representative in London, where he wrote satires and translated Latin classics. In 1738 he was transferred to Paris, where he continued to write satires and translated parts of Boileau and Montesquieu into Russian. His writings are mainly notable as those of a pioneer. He died in Paris, April 11, 1744.

Kantémir, DEMETRIUS (1673–1723). Prince of Moldavia. Born Oct. 26, 1673, of a Moldavian noble family, he was elected prince in 1710. When Russia and Turkey went to war, he took the side of the former in order to free his country from Turkish rule. After the defeat of the Russians by the Turks on the Prut (1711), he left his country and retired to St. Petersburg. There he became one of the founders of the Academy and wrote historical and other works, including a History of the Growth and Decay of the Ottoman Empire, Eng. trans. N. Tindal, 1756. He died Aug. 23, 1723.

Kaolin. A clay mineral, hydrated aluminium silicate ($\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$). Forming the bulk of the material known as china clay, kaolin (or, more correctly, kaolinite) has the same composition as the rare minerals nacrite and dickite, from which it may be distinguished by optical properties. It is a soft, whitish, earthy mineral crystallising in small monoclinic (pseudo-hexagonal) plates. A common weathering product of feldspars in granite,

it may be derived thence by the action of ascending thermal fluids.

There are important deposits in Cornwall, England, and in various districts of France, Germany, the U.S.A., and China. From the deposits at Kaoling in the last country comes the name, and also that of china clay (*q.v.*).

Kaolin is used in medicine to absorb toxic material in the large intestine. It is thus curative in certain cases of diarrhoea and flatulence. Kaolin poultice (*Cataplasma kaolini*) is a paste containing kaolin, boric acid, glycerine, and other ingredients. Applied hot it retains its heat for a long time and with the hygroscopic action of the glycerine is a useful treatment in many inflammations. The tendency is to apply the poultice too hot and too thinly spread.

Kapital, DAS. Chief work of the German economist Karl Marx (*q.v.*). The first volume was published in 1867; the third and last was synthesised by Friedrich Engels from notes left by Marx at his death in 1883. The book deals basically with the theory of surplus value, which claims that a workman's labour possesses more intrinsic value than is required to support him, and that the surplus is filched by exploiting capitalists as their profit.

Kapitza, PETER (b. 1894). Russian physicist. Born at Kronstadt, June 26, 1894, he was educated at Petrograd (Leningrad) polytechnic, and was assistant director of research in magnetism, 1924–32, at the Cavendish Laboratory, Cambridge, where he was director of the Royal Society Mond Laboratory, 1930–35, and worked with British scientists on atomic physics. He visited the U.S.S.R. in 1935, was refused permission to return to England, and was made director of the institute for physical problems of the Academy of Sciences. He was awarded the Stalin prize, 1941 and 1943, and the Order of Lenin, 1943.

Kapok (Eriodendron anfractuosum). A tall evergreen tree of the family Bombacaceae. It is a native of the W. Indies. It has a prickly stem 100 ft. high, and the leaves are divided, finger-fashion, into 5 to 8 lance-shaped leaflets. The yellow flowers are coated externally with silky wool, and the woody capsules, like

those of the cotton plant, are filled with silky hairs attached to the numerous seeds. These filaments, of fluff-like material, are produced in huge quantities, but owing to their smooth edges cannot be spun into threads as are those of cotton. Being impervious to water, kapok has a use for stuffing life-jackets and raft-floats, while its elasticity makes it a suitable filling for cushions and pillows. From the seeds of kapok is expressed an oil used in both cooking and soap making.

Kapp, EDMOND (b. 1890). A British artist. Born Nov. 5, 1890, he was educated at Owen's School, London, Berlin university, and Christ's College, Cambridge. He held his first exhibition of drawings in 1919, and became well known for mordant studies of social and political figures and as an outstanding lithographer. His Nations at Geneva (series of 25 portraits), 1934–35, were acquired for the British Museum, National Portrait Gallery, and other collections. His 70 drawings of the London Philharmonic orchestra appeared in 1943. He is represented at the Victoria and Albert Museum; the Fitzwilliam, Cambridge; and Ashmolean, Oxford.

Kapraena. Village of Boeotia, Greece. It is situated 9 m. N.E. of Livadia, and occupies the site of the ancient Chaeronea. At the foot of the Acropolis are the remains of one of the most ancient theatres in Greece. The small church of the Panagia contains a marble chair reputed to have belonged to Plutarch.

Kapteyn, JACOBUS CORNELIUS (1851–1922). Dutch astronomer. Born Jan. 19, 1851, at Barneveld, Gelderland, in 1875 he became an astronomer at Leyden observatory and in 1878 professor of astronomy at the university of Groningen. With Sir David Gill, he carried out the photographic star catalogue of the southern heavens, undertaking the measurements and reductions of the photographs taken at the Cape. His principal work was a statistical study of the stars from which he deduced the size and shape of the galactic system. He died June 18, 1922.

Kapuas. River of Western Borneo. The basin is bounded on the N. by the Sarawak frontier and on the S.



Kapok. Foliage, flowers, seed, and seed-pod

by the Schwaner Mts.; its source is near the centre of the island at an elevation exceeding 13,000 ft. The lower course leads to a delta facing Carimata Strait.

In an earlier geological epoch the river was tributary to a great stream which flowed to the N.E. in a deep well-marked valley on the S.E. of Great Natuna Island; this great stream once flowed over Sunda Land, which has been submerged beneath the Sunda Sea, and the direction of its course can be traced on the ocean floor. The delta of the Kapuas is a rare phenomenon in the East Indies; it indicates the way in which heavy loads of silt brought down by the Kapuas have obscured the earlier drowned valley formation of the river estuary. The basin contains Tertiary coal measures. Pontianak, 15 m. from the mouth, is the chief town; large ships can navigate the river for 450 m.

Kapurthala. Former state of India, now part of the Patiala and E. Punjab union. Two-thirds are under cultivation, wheat being the chief crop. The industries include the manufacture of hand-painted cloths at Sultanpur. Agricultural produce, including wheat sugar, and cotton, is exported. The former ruling dynasty was founded by Sardar Jassa Singh Ahluwalia, the leading Sikh chief in the Punjab. Kapurthala town, the capital, contains the palace of the maharaja. Area, 645 sq. m. Pop. 378,380, the great majority being Sikhs.

Karachayev. This formerly autonomous province of R.S.F.S.R. lost its status in 1946, being mostly absorbed by Georgia S.S.R., while its capital Mikoyan-Shakar was renamed Klukhori.

Karachev. Town of R.S.F.S.R., in Briansk region. It lies 45 m. W.N.W. of Orel on the rly. to Smolensk. The Germans occupied Karachev on Oct. 12, 1941, after the fall of Briansk, but lost it to the Russians Aug. 15, 1943. Tallow and flax provide industries, and normally there is trade in grain.

Karachi. Capital of Pakistan and seaport of Sind. It is at the W. end of the Indus delta on the left bank of the distributary which enters Karachi Bay, an arm of the Arabian Sea sheltered by a long narrow sand spit. Cottons are manufactured, and there is trade in salt, but Karachi is most important as the outlet for the rich crops, mainly wheat, of the Punjab and Sind. Wheat growing has greatly increased since the construction of the Lloyd Barrage at Sukkur. Linked with the development of Karachi has been that of Keamari, originally an island, on which have been erected the wharves and docks of a magnificent modern port. Keamari is joined to the city by the Napier mole, 3 m. long. The suburb of Clifton is one of the few seaside resorts in the sub-continent. Although the climate is hot, the prevailing S.W. wind tempers the heat for eight months of the year. Average rainfall is under 8 ins.

Karachi is connected by rly. with Quetta and the N.W. frontier, and lies on air routes from Europe to the East and Australasia. The military air base at Mauripur was used extensively in the Second Great War. There is a seaplane station. Originally a fishing village, the city contains remains of the ancient town of Tatta. First occupied by British forces in 1838, its development has been rapid. An area to W. and N.W. was devastated by a tidal wave on Nov. 28, 1945. Pop. 359,492.

Karafuto. Southern portion of the island of Sakhalin in the Sea of Okhotsk—i.e. that part S. of 50° N. Annexed by Japan, 1905, it was restored to the U.S.S.R. in 1945. It is 2,937 m. from N. to S. and from 20 to 98 m. wide, slightly larger than Formosa, its area being 13,934 sq. m. Two chains of mts. run from N. to S. Karafuto is largely covered with primeval forest, the valley floors alone being cultivable. Coal and gold occur and the seas teem with herring, which provide the chief industry. The governor resides at Toyohara, which is connected by rly. with the coasts at Otomari and Sakahama. Pop. 415,000.

Karaganda. Town of Kazakh S.S.R. This place on the steppe in the centre of the republic did not



Karachi, Pakistan. 1. Air view of the harbour in this capital city. 2. Bunder Road, with the town hall on the left. 3. Another of the principal streets, flanked by buildings of modern architecture

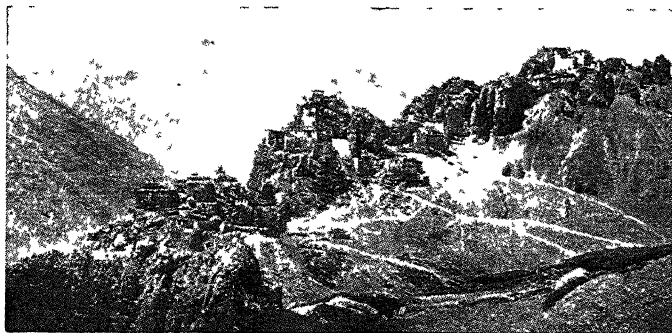
exist before the Soviet five-year plans. It is linked by rly. with Akmolinsk and Lake Balkhash, and gives its name to a region. In the latter is an agricultural trust covering five million acres. About seven million tons of coal are yielded annually, while copper, manganese, and tungsten occur. Pop. 165,937.

Karageorgevitch. Name of the last reigning dynasty in Yugoslavia. The Karageorgevitch dynasty was founded as the Serbian ruling house by Kara (Black) George Petrovitch (1762–1817), who in 1804 led an insurrection against Turkish rule, and was proclaimed hereditary chief and hospodar of the Serbs, Dec. 26, 1808. Under him Serbia gave active help to the Russians, and for this Turkey exacted a terrible revenge in 1813, crushing the country with overwhelming forces. Kara George was compelled to flee; when he reappeared in 1817 to lead another rising against the Turks he found little support, and was assassinated, July 13, 1817. In 1842 the Serbs recalled the dynasty in the person of Alexander (1806–85), younger son of Kara George. He was recognized by the Sublime Porte in 1848, but on Dec. 24, 1852, was deposed by an Obrenovitch conspiracy.

On the murder of Alexander Obrenovitch, Peter Alexandrovitch Karageorgevitch (1844–1921) was called to the throne, June 11, 1903, and was crowned in 1904 with a bronze crown made from cannon captured from the Turks by his ancestor. His elder son George renouncing his right of succession, the second son Alexander (1888–1934) was recognized as crown prince, and became regent in 1915. In 1921 he succeeded to the throne of Yugoslavia to reign until Oct. 9, 1934, when he was assassinated in Marseilles. The crown prince Peter (b. Sept. 6, 1923) being a boy, a council of regency was set up under his uncle, Prince Paul (b. 1893). On March 25, 1941, King Peter assumed power after a bloodless revolution when the regency capitulated to the Axis; but in April Yugoslavia was overrun by German forces, and he was compelled to flee. He was head of a govt. in exile, at first in London, later in Cairo; but differences between him and the Yugoslav partisan leader Marshal Tito grew acute: a council of regency was appointed in Feb., 1945; and on Nov. 29 the constituent assembly declared for a republic and divested the king and his dynasty

of their rights. In 1947 he and his family were deprived of Yugoslav citizenship, and their property was confiscated. *See* Obrenovitch; Serbia; Yugoslavia.

Kara Gulf. S.E. arm of the Kara Sea in the Arctic. Penetrating about 150 m. inland, on its



Karakoram. Buddhist monasteries built for security on high rocks in the Karakoram mountains of Kashmir

S. shore it receives the Kara river, there forming the conventional boundary between Europe and Asia. Kara Strait is between Novaya Zemlya and Vaigatch.

Karaites. Jewish sect. It accepts the text of the O.T. literally, but rejects the Talmudic interpretations of it. The Karaites arose about A.D. 750 as opponents of Rabbinism, and still exist as a school of thought, though not as a separate sect. They strictly observe all details of the Mosaic Law; and strongly repudiate any responsibility for the action of the Jews who killed Christ. *See* Jews.

Karajitch, VUK STEFANOVITCH (1787–1864). Serbian scholar, called the father of modern Serbian literature. Born at Trschich, Nov. 6, 1787, he was educated at a monastery and at Karlowitz, Austria. During 1804–13 he was secretary to one of the insurgent commanders in the Serbian rising against the Turks. He afterwards went to Vienna, where he met the Slavonic scholar Kopitar, at whose instance he began his life work of compiling a Serbian grammar and lexicon and collecting the national songs and poems in the vernacular. His Serbian folk-songs and grammar were published in 1814; his Serbian dictionary in 1818, revised and greatly enlarged, 1852. He died in Vienna, Feb. 6, 1864.

Kara-Kalpak. People of Altaian stock who give their name to an autonomous republic in Uzbek S.S.R. Their capital is Nukus. Tall, sturdy, broad-faced, large-eyed, they betray much racial admixture; they were once the

dominant people immediately E. of the Aral Sea. They are horse-breeders and husbandmen, while the women weave carpets.

Karakoram OR **MUSTAGH.** Mt. range of Central Asia. Containing some of the highest summits in the world, the range extends S.E. for

over 400 m. from the Pamirs to the Himalayas across the N.E. portion of Kashmir. The highest point is Mt. Godwin Austen, or Peak K2, alt. 28,278 ft.; other high peaks are Mustagh, 27,000 ft., and Gasherbrum, 26,360 ft. The range is crossed by several high but easy passes, e.g. the Karakoram, the Mustagh, and the Hispar. The Karakoram Pass is on the route from Sinkiang to Baltistan, descending into the depression of the Shyok. These passes reach an elevation of 19,000 ft. Glaciers, the Biafo, Siachen, Hispar, and Baltoro, are among the largest of continental ice-sheets. The Karakoram Mts. connect the Himalayas with the Hindu Kush.

Karakorum (Mongol, *Kara Kuren*, black camp). Ruined city of China, in Outer Mongolia. It was the old Mongol capital before the court settled at Peking (Peiping). The vast ruins, covering an area of 6 m. in circuit, lie near the source of Orkhon river, N. of the Gobi Desert, 208 m. W. by S. of Urga. One of the chief camps of Jenghiz Khan, the place became the capital of the Mongolian empire in 1234. Though known to Marco Polo, its situation was unknown to Europeans until 1889, when it was visited by the Russian explorer Yadrintsev.

Kara-kul, GREAT. Lake of Tadzhik S.S.R. Situated at an alt. of 12,800 ft., it is S. of the Alai Tagh range on the borders of Kirghiz S.S.R. and Sinkiang.

Karamania OR **CARAMANIA.** Region of Asiatic Turkey. A flourishing kingdom in the Middle

Ages, it is part of the vilayet of Konieh, and consists of a high plateau, now barren, but formerly well cultivated. It is very thinly peopled, and has some trade in cattle. The chief town is Karaman, the ancient Laranda, about 60 m. S.E. of Konieh.

Karamnasa. River of India. Rising in the Kaimur Hills near Sarodag, it forms part of the boundary between Bihar and the Uttar union. After a course of about 150 m. it enters the Ganges near Chausa.

Karamzin, NICHOLAS MICHAIL-OVICH (1765–1826). A Russian historian. Belonging to a noble Tartar family, he was born at Mikhailovka, Orenburg, Dec. 12, 1765. He travelled widely over Europe, visiting Germany, Switzerland, France, and England. Returning to Moscow in 1791, he began editing *The Moscow Journal*, to which he contributed *Letters of a Russian Traveller*, which were later published as *Travels from Moscow* (Eng. trans. 1803).

In 1792 he published two sentimental novels, followed in 1802 by a third. About the same time Karamzin began the historical writing which made him famous, his *General History of Russia* down to 1613, 1816–29, in 11 vols., the last being by another hand (Fr. trans. 1819–29). Appointed imperial historiographer in 1803, in 1811 he published his celebrated *Memoir on Ancient and Modern Russia*. He died at St. Petersburg, June 3, 1826.

Kara Sea. Name of part of the Arctic Ocean. Between Novaya Zemlia and the island of Vaigatch on the N.W. and the Siberian peninsula of Yamal or Samoyed to the S.E., it is included in the prov. of Omsk, is 440 m. long and 280 m. broad, and is frozen over from Sept. to June.

Kara Su (Turk., black water). Name of several streams. The more important are one of the headwaters of the Euphrates, the ancient Melas, a tributary of the Kizil Irmak, N. Turkey; the Kara Su, or Mesta, in Bulgaria and Macedonia; and a Persian tributary of the Aras, which it joins S.E. of Ararat.

Karatepe. Site in Turkey of archaeological discoveries, 1947. See Hittites in N.V.

Karauli. Town and former state of India, since 1949 part of Rajasthan. A hilly tract, the cultivated area is about one-fifth, millet and grain being the principal crops. Among the exports are cereals and cotton, the

imports including piece goods. Area, 1,227 sq. m. Pop., state, 152,413; town, 20,120.

Karawanken. Range of the Eastern Alps, on the Austrian-Yugoslav frontier. It continues the Carnic Alps eastwards between the valleys of the Save and Drave. The chief peak is the Stou, 7,335 ft. The rly. line from Klagenfurt to Trieste runs through the Karawanken tunnel, 5 m. long, which terminates at Birnbaum.

Karelia OR KARELO-FINNISH REPUBLIC. Twelfth republic of the U.S.S.R. Bounded W. by Finland, N. by Murmansk province, E. by the White Sea, and S. by Leningrad province, it has an area of 69,720 sq. m. Timber forms the chief wealth of the country; there are also large deposits of diabase, quartz, mica, marble, granite, zinc, lead, silver, copper, molybdenum, and tin. Industrial installations include timber mills, chemical plants, and paper-cellulose works. There are both collective and Soviet state farms. Fish are plentiful in the 20,000 lakes as well as in the rivers. The construction of the White Sea-Baltic Canal aided the economic development of the country. Petrozavodsk, the capital, has rly. connexion with Kola in Murmansk and Sortavala in Finland. Kandalaksha is the terminus for Kuolayarvi, Finland, while air lines maintain services with Leningrad and Viipuri.

After the Bolshevik revolution of 1917, Karelia was incorporated in the R.S.F.S.R., becoming the Karelian A.S.S.R. in 1923. After her defeat by Russia in 1940, Finland ceded to the U.S.S.R. all her Karelian territory, the title of the enlarged republic being changed. In 1941 Finland again declared war on the Soviet Union, and aided by the Germans drove the Russians out of Karelia, which was incorporated in Finland. Three years later Russian forces regained the territory. Pop. approx. 900,000.

Karen. People of the Siamese-Chinese sub-family. They mostly live in the central watersheds of Burma. Numbering about one million—including Taungthu—with about 60,000 in N. Siam, they are shorter, lighter-hued, and more oblique-eyed than the Burmese. The wild Bghai include the Red Karen, inhabiting palisaded villages. See Burma; Karenni.

Karenni. Name formerly given to three states—Kantarawadi, Bawlake, and Kyebogy—geographically in Burma but long

independent under British protection, guaranteed by treaty in 1875. In 1947–48 discussions with the Burmese cabinet led to the establishment of one semi-autonomous Karen state, within the Burma Union. This is bounded by the Shan state, Tenasserim and Siam. Area 4,519 sq. m. Pop. 58,761. See Burma.

Karikal. A town of India, in French possession since 1815. On the Coromandel coast between Tanjore dist., Madras, and the Bay of Bengal, it lies in a highly fertile neighbourhood. The town exports rice, and is a headquarters of coolie emigration. The port is an open roadstead, with lighthouse 142 ft. high. Pop. 19,363. Karikal administrative region covers 53 sq. m. Pop. 60,555.

Karimata OR CARIMATA. Group of about 100 islands and reefs in Indonesia. They lie in Billiton Passage, W. of Borneo, and have an area of 57 sq. m. Grand Karimata rises to 2,600 ft., and contains Palembang, the largest village. Pop. 500.

Kariot OR NIKARA. Island of Greece, the ancient Icaria. It is one of the Sporades, and lies in the Aegean about 12 m. W. of Samos. Its chief town is Phanari; the area is 103 sq. m.

Karkar OR QARQAR. Ancient town in the Orontes valley near Hamath, N. Syria. It was the scene of two famous battles. In one, the Assyrian Shalmaneser in 854 B.C. utterly defeated a huge N. Syrian concentration. In 720 B.C. Sargon of Assyria overthrew another confederation here.

Karlfieldt, ERIK AXEL (1864–1931). Swedish poet, born July 20, 1864, in Dalarna (Kopparberg co.). Librarian of the agricultural academy at Stockholm, 1903–12, he was appointed in 1904 a member and in 1912 the permanent secretary of the Royal Swedish Academy. In about half a dozen volumes of lyric poems from 1895 to 1927 he sang the praise of his native Dalarna with consummate art in rhyme, rhythm, and language, combining humour with insight into the people's feelings, so that he became the most popular contemporary poet in Sweden. In 1931 he was awarded the Nobel prize for literature posthumously, having died April 8.

Karloff, BORIS (b. 1887). A British film actor. Born Charles Edward Pratt, Nov. 23, 1887, he was educated at Uppingham and King's College, London. He went to Canada in 1909; and entering American films in 1920, he became

famous for macabre and horrific character studies, *e.g.* in Frankenstein, 1932. His other pictures included Scarface; The Miracle Man; The Invisible Ray; The Tower of London, 1940.

Karlovac. Another form of Karlovyvaros, town of Yugoslavia.

Karlovy Vary. Czech name of the town historically known as Karlsbad (*q.v.*).

Karlowitz, TREATY OF. Treaty concluded between Turkey and the allied states of Germany, Venice, Russia, and Poland, on Jan. 26, 1699. Karlowitz lies 5 m. S.E. of Novi Sad (Neusatz). After Prince Eugene's victory over the Turks under Mustapha II at Zenta, Sept. 11, 1697, the Turks were obliged to accept the terms proposed by the emperor Leopold I. By the treaty, signed after 72 days' negotiations, the emperor received Transylvania, all Hungary except the Banat, and the greater part of Slavonia; Venice acquired the Morea, and Poland part of the Ukraine. The treaty represented the first stage in the dismemberment of the Muslim empire in Europe. *See* Hungary: History; Turkey: History.

Karlsbad OR KARLOVY VARY. Town and health resort of Czechoslovakia, in Bohemia. Before the First Great War in Austria, it was in 1938 transferred to Germany as part of Sudetenland. It lies on the Tepl, near its confluence with the Eger, at a height of more than 1,100 ft., 70 m. W.N.W. of Prague, in picturesque surroundings. It has been famous for its warm alkaline springs, over which the town is to a large extent built, from at least the 14th century. The waters, used for bathing as well as drinking, vary considerably in natural warmth, from 163° (the Sprudel) to 85° Fahr. Visitors in normal times number about 70,000 a year; the main occupation of the town is supplying their needs. Pop. 53,763.

Karlsbad Decrees. Resolutions passed by representatives of the German states at a congress held at Karlsbad in Aug., 1819. It was summoned by Metternich, who presided, and a principal object was to repress the liberal agitation

then proceeding in Germany. The resolutions comprised the institution of a press censorship, supervision of educational establishments to prevent political propagandism in schools and universities, and the appointment of a commission to expose the machinations of the advanced liberal party. The resolutions were adopted by the diet, and probably helped to restrain in Germany the revolutionary movement that shook France in 1830.

Karlsburg. Town of Rumania, now called Alba Julia and so described in this work.

Karlscrona. Fortified seaport of Sweden, capital of the län or govt. of Blekinge. It stands on five islands in a bay of the Baltic, 240 m. direct and 350 m. by rly. S.S.W. of Stockholm. The chief naval station of Sweden, it has arsenals, shipbuilding yards, docks, naval schools, and hospital. It has a trade in matches, cloth, and tobacco. Pop. 31,871.

Karlshamn. Seaport of Sweden, in the län or govt. of Blekinge. It stands on the Baltic, 30 m. by rly. W. of Karlscrona, with a school of navigation, shipbuilding yards, distilleries, and manufactures of leather, tobacco, etc. There are facilities in the harbour for the trade in petroleum.

Karlsruhe OR CARLSRUHE. City of Württemberg-Baden, Germany. A modern town, founded in 1715

after 1870. Many were heavily damaged in the Second Great War.

On the main N.—S. road and rly. between Frankfort and Basel, and on the Paris-Vienna line, this is an important junction, besides being the starting point for tours of the Black Forest, and the spas and sights of Heidelberg, Baden-Baden, and Freudenstadt. It had eight stations, and its port dealt with nearly 7,000 vessels and 2½ million tons of goods annually. Industries concern metal work, sewing machines, food preserving, printing, ceramics, cosmetics, drugs, beer, locomotives, and heating equipment.

Karlsruhe had a great reputation in arts and crafts, with a famous art school; some of Germany's outstanding painters—Thoma, Leibl, Trübner—lived and worked here. It had four great libraries, and zoological and botanical gardens. One of the first towns built completely to plan, it presented a uniform picture, dominated by the palace. Frequently bombed during the Second Great War, Karlsruhe was the first target attacked by the R.A.F. with the 8,000-lb. "blockbuster" bomb, Sept. 2, 1942. The city was captured by troops of the French 1st army on April 4, 1945. Pop. pre-war, 189,850.

Karlstad. City of Sweden, capital of the län or govt. of Värmland. It is picturesquely placed on Tingvalla island at the N. end of Lake Vänern, 205 m. by rly. W. of Stockholm. It has a cathedral, an airport, and manufactures of matches, machinery, and tobacco. It was rebuilt after the disastrous fire of 1865. Here the agreement dissolving the union of Norway with Sweden was signed, Sept. 23, 1905. Pop. 32,297.

Karma (Skt. action, sequence). Idea, originating in Brahmanism and developed in Buddhism and theosophy, of the inscrutable law of cause and effect determining man's future. In the place of the idea of a Supreme Being it postulates the theory of something inherent in the nature of things. Qualities need not be instant in action, they may lie dormant, but the intimacy between cause and effect is constant and inevitable. Another term for Karma is ethical causation.

Karmakuly. Chief settlement of Novaya Zemlia, Arctic Ocean. It is a government station on Moller Bay, an inlet on the W. coast of South Island. Established in 1878, it contains a church for the Samoyed inhabitants.



Karlsbad, Czechoslovakia. Air view of this famous spa; its alkaline springs were known in the 14th century

around his hunting lodge by the margrave Charles William, it is 6 m. E. of the Rhine, with an up-to-date river port. Outstanding buildings are the palace (1752–82), another palace (1740) in the Durlach suburb, and a church of the same period. The parliament buildings, art gallery, technical university, and town hall date partly from the first half of the 19th century, partly from

Karmö. Island of S.W. Norway. It is N. of the mouth of Bukken Fjord, 20 m. N.W. of Stavanger, is 19 m. long and 5 m. broad, and has an area of about 100 sq. m. Low-lying and marshy, with a mild climate, it has herring fisheries. The chief towns are Kopervik and Skudesnaeshavn, a port at the S. extremity of the island. Numerous barrows in the vicinity have yielded interesting historical relics.

Karnak. Modern Arabic name for the site of ancient Thebes, which is now represented by the great temples of Karnak and Luxor on the right bank of the Nile in Upper Egypt. Thebes, the No Amon of the Bible, the ancient Egyptian Niwt (City of Amon), was also known to the Greeks as the City of the Hundred Gates. It was the capital of Egypt in the time of the New Empire. The temples of Karnak are, so far, the most interesting part of Thebes.

The plan of the Great Temple of Amon is complex because it was not built by a single hand to uniform design. Successive kings from the Middle Empire to the Ptolemaic period (i.e. during 2,000 years), took some share in adding to or enlarging the Temple of Amon, the King of the Gods. This, with its pylons, courts, halls, sanctuary, obelisks, and sacred lake, on which the procession of the sacred bark took place, was dedicated to the Triad of Thebes: Amon, his consort Mut, and their son Khonsu.

The finest building was the work of Seti I and Rameses II, who added the superb hypostyle hall, 338 ft. by 170 ft., the stone roof of which was borne by 134 columns (the central 12 being 80 ft. high and 122 in the aisles 42½ ft. high). These sandstone columns and walls are inscribed with reliefs. On the exterior N. and S. walls are shown scenes commemorating the Syrian campaigns of Seti and Rameses. An avenue of sphinxes leads from the temple of Karnak to that of Luxor. Legrain unearthed in 1903-05 a cache comprising 750 large stone monuments and 20,000 smaller objects. Engineering and architectural work goes on continually. See Egypt: Obelisk; Pentaur; Pylon.

Karnal. Dist., subdivision, and town in India, in the Delhi division of Punjab. About two-thirds of it is under cultivation, wheat, gram, and millet being among the principal crops. Wheat and cotton are among the chief exports. Area of dist., 3,126 sq. m. Pop., dist., 994,575; town, 46,000.

Karno, FRED (1866-1941). A British comedian. Frederick John Westcott was born at Exeter of working-class parents. After being apprenticed to a plumber, he began his stage career as an acrobat. He then had a troupe of his own, and in the first decade of the 20th century became well known as a producer of knockabout music hall sketches, the most famous of which was *Mumming Birds*, in which many great comedians, including Charles Chaplin, appeared at early stages of their careers. Through the Karno sketches, his stage name came to be popularly associated with anything ludicrously ramshackle: hence, in the First Great War, the soldiers' satiric song, sung to a well-known hymn-tune, "We are Fred Karno's army." A wine and spirit merchant at Parkstone, Dorset, Westcott died Sept. 18, 1941.

Károlyi, ALOYS, COUNT (1825-89). Austro-Hungarian statesman. He was born in Vienna, Aug. 8, 1825, of noble family. In 1858 he tried to obtain Russia's co-operation against Napoleon III, and in 1866 conducted peace negotiations with the victorious Prussians following the Seven Weeks' War. A plenipotentiary at the congress of Berlin (1878), he was the Austrian ambassador to Germany from 1871 until his transfer to England in 1878. He died December 2, 1889, the foremost diplomatist of his country.

Karolyvaros OR KARLOVAC. Town of Yugoslavia. It is on the Kulpa, 42 m. S.W. of Zagreb on the main rly. to Fiume. It dates from 1579 and it contains R.C. and Orthodox cathedrals. There is trade in grain and timber.

Karonga. Town and port at the N. end of Lake Nyasa, in Nyasaland. It is connected with Lake Tanganyika by the Stevenson road, and with Fort Johnston at the S. end of the lake by steamship.

Karpathos. Ancient name of an island in the Aegean Sea, now known as Scarpanto (q.v.).

Karput, KHARPUT, OR HARPUT. Town of Asiatic Turkey, in Elazig vilayet. It lies near the sources of both the Euphrates and the

Tigris, about 100 m. S. of Erzingan. It has a considerable trade in cottons, wines, and oil; and a Jacobite convent, famous for its rare MSS. Karput was the scene of Armenian massacres in 1895.

Karrer, PAUL (b. 1889). Swiss chemist. Born at Zurich, April 21, 1889, he was a pupil, at the university, of Alfred Werner, and successor to his chair in 1919. From 1913 Karrer had been assistant to Ehrlich, the discoverer of salvarsan. His own research was mainly on vitamins, of which he was the first to produce, with Euler-Chelpin, the variety A in pure form, 1931. He did important work in respect of the antipellagra Vitamin B₂. In 1937 Karrer was awarded the Nobel prize for chemistry, together with W. N. Haworth, for research on carotenoids, flavins, and Vitamins A and B. He influenced the whole modern school of chemistry with his Textbook on Organic Chemistry, 1927.

Karri (*Eucalyptus diversicolor*). A tree of the family Myrtaceae, native of Australasia. Its characteristics are similar to those of the

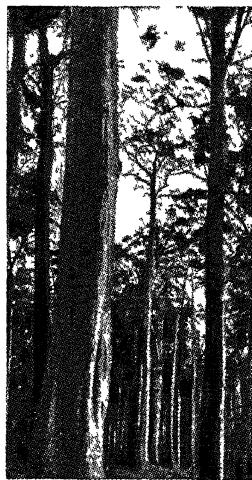
other gum trees, and its hard wood makes blocks for paving roads. Vats also are made from it.

Karoo. Name of the high plains of the Cape Province and more especially the dist. (the great Karroo) between the Nieuwveld Mts. on the north and the Zwaarte Bergen on the south. Its mean elevation is 3,500 ft.; total area about 100,000 sq. m. The Southern Karroo consists of the highlands lying between the Zwaarte Bergen and the coastal ranges. The climate is healthy, and as

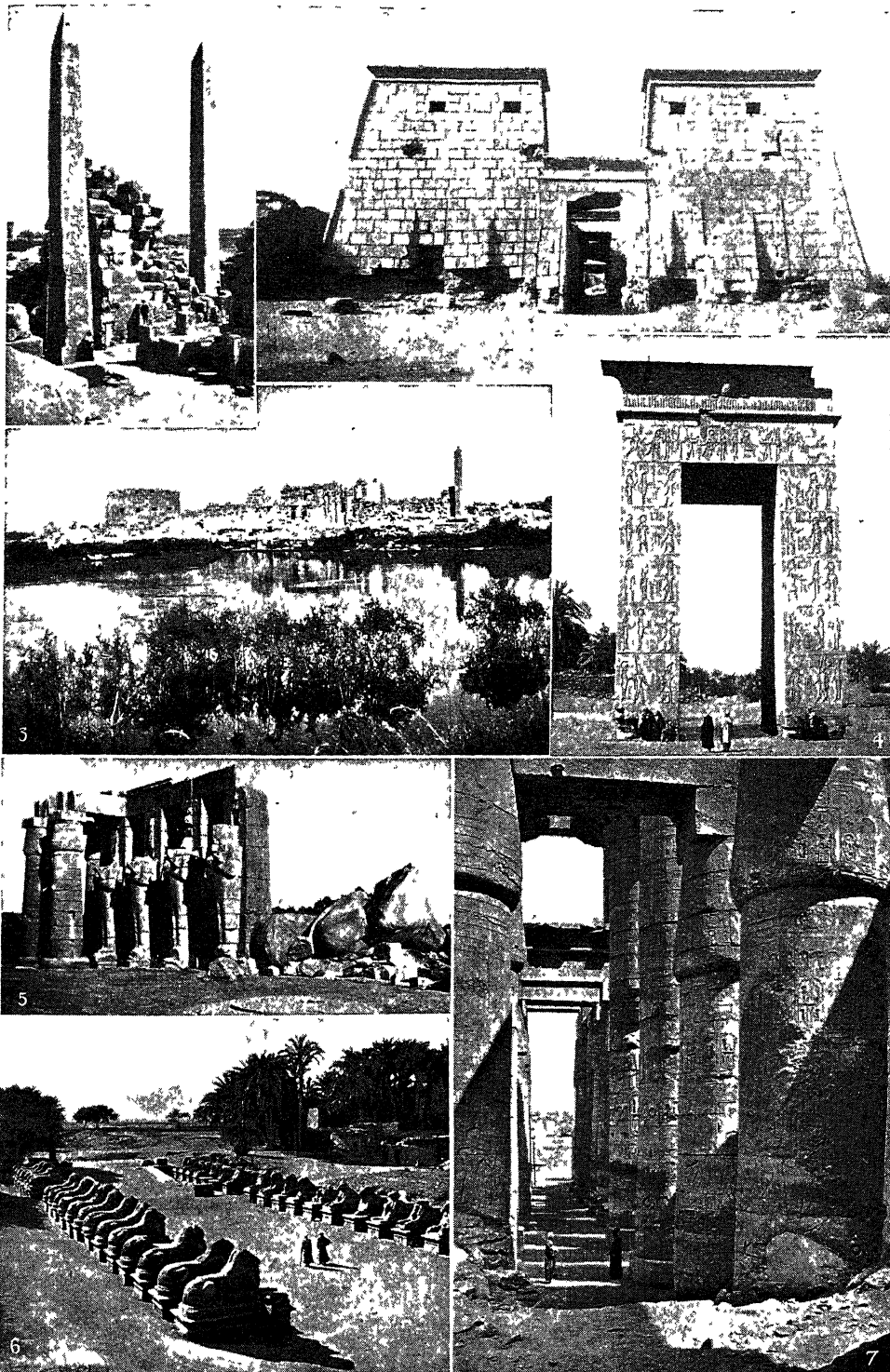
rainfall does not usually exceed 12 ins. annually, the area is suitable mainly for stock raising.

Karoo System. In geology the series of sandstones and shales of S. Africa. They contain fossil remains of amphibians and reptiles, chiefly of the Triassic period. The system contains volcanic pipes which have resulted in the great diamond deposits of S. Africa.

Kars. Easternmost vilayet of Turkey, bordering Armenia S.S.R. Its capital of the same name stands on the Arpa-Chai, 100 m. N.E. of



Karri, the giant gum tree. Its wood is used for paving-blocks



1. Obelisks of Tehutmes (Thothmes) I and Queen Hatshepsut. 2. Ptolemaic pylon at the entrance to the Temple of Amen-Ra (Ammon). 3. Temple of Amen-Ra from across the Sacred Lake. 4. Pylon of Ptolemy III Euergetes. 5. Fallen statue of Rameses II beside the Ramasseum on the Theban plain. 6. Avenue of ram-headed sphinxes erected by Rameses II. 7. Columns in Hypostyle hall, Temple of Amen-Ra

KARNAK: RUINED REMAINS OF THE FAMOUS EGYPTIAN SANCTUARY

Eizerum, a very important and strongly fortified position. It was known to the ancients as Khorzēnē, and in the 10th century was the seat of an independent Bagratid (Armenian) principality. It was occupied by the Turks in 1546, but its possession was frequently disputed by Persians, and by Russians, who besieged and captured it three times during the 19th century (1828, 1855, 1878). It was incorporated with Russia by the treaty of Berlin. When the Russians withdrew from Armenia in the winter of 1917-18, the Turks conducted a successful offensive in Caucasia, capturing Kars on April 27, 1918, and other towns. Turkish possession was confirmed by treaty in 1921. The capital makes carpets and felt. The village is rugged and forested, with a severe climate. Pop. 383,222.

Kars, SIEGE OF. Russian operation in the Crimean War. On June 16, 1855, the town was surrounded by the Russians. The Turkish garrison, commanded by Col. W. Fenwick Williams, made a gallant sortie on Sept. 29, inflicting heavy losses on the besiegers, but there was little hope of relief, cholera and famine were daily increasing, and finally Williams was obliged to capitulate, Nov. 28.

Karsavina, TAMARA (b. 1885). A Russian dancer. She trained in the schools of the imperial ballet at St. Petersburg, under Cecchetti,

first appeared as a dancer at the Marinsky Theatre in 1902, and succeeded Pavlova as *première danseuse* at the Imperial Opera House in 1910. She appeared with Nijinsky in the Diaghilev company in Paris and London, creating the rôle of The Fire Bird and leading parts in *Le Spectre de la Rose* and *Petrouchka*. These parts, with her Giselle and Scheherazade were memorable

for perfect technique. In 1929 she published her reminiscences, *Theatre Street*. A favourite with English audiences, she married Henry Bruce, British diplomatist.

Karst or **CARSO**. Limestone dist. of Yugoslavia, large areas N. and E. of the Adriatic, where typical phenomena of limestone regions are developed to a remarkable extent. The ruthless cutting down of the forests which formerly largely covered these mountainous lands has led to washing away of the surface soil, the exposure of the limestone rocks at the surface, and the formation of swallow holes or dolinas (*q.v.*), while caves and long underground galleries are numerous. Except in valleys where soil has accumulated, the Karst is naturally infertile and incapable of supporting many people. The name is now widely used for other limestone regions possessing similar characteristics, *e.g.* the plateau of Central France, and, to a less degree, the Pennine Range and other English limestone areas. *See* Carso.

Kartikeya or **KUMARA**. Hindu god of war. The legends, reducible to two main versions, make him: (a) a son of Agni, fire, and Ganga, Ganges; (b) a manifestation of Siva, from whose eyes six sparks became infants, so intimately embraced by his consort Parvati that their bodies, but not their heads and limbs, became one. Kartikeya is represented astride a peacock, with bow and arrow, and his worship prevails through S. India under the name Subramanya.

Karun. River of W. Persia. The only navigable stream in the country, it rises in the Bakhtiari Mts. about 100 m. W. of Ispahan, and, flowing through the prov. of Khuzistan joins the Shatt-el-Arab at Khorramshahr some 45 m. from the Persian Gulf. Small steamers can ascend it as far as Ahwaz.



Kars. The town and fortress long contended for by Russians and Turks

Karur. Subdivision and town of India, in Trichinopoly dist., Madras. Karur town is a local trade centre of some importance and considerable antiquity. Area of subdivision, 710 sq. m. Pop.: subdivision, 327,501; town, 27,575.

Karwar. Subdivision and town in India, in N. Kanara dist., Bombay. Karwar town has a good harbour, the only one safe at all seasons between Bombay and Cochin. To the E. are the ruins of the old town, once a flourishing commercial centre, where an English factory was opened in 1638. Area, subdiv., 281 sq. m. Pop., subdiv., 68,376; town 20,400.

Kasai. Tributary of the river Congo (*q.v.*). The main branch rises in Angola and flows at first E. and afterwards N., forming the boundary with Belgian Congo. Joined above Basongo by the Sankuru, it runs N.W. to its junction with the Mfni, then as the Kwa falls into the Congo. It was explored by H. von Wissmann in 1885. Diamonds are exported from the Kasai district of the Belgian colony.

Kasanga. Town of Tanganyika. Formerly known as Bismarckburg, it is a port on the S.E. extremity of Lake Tanganyika and the principal trade outlet for the native villages along the E. shore.

Kasauli. A hill station in Sir-mur, Himachal union, India. It is 32 m. S.W. of Simla and dates from 1844. The central research institute for medical research was opened in 1906. It includes the Pasteur Institute (1900) and the library of the malaria institute. It is on the rly. connecting Ambala and Simla. Kasauli Hill is 6,322 ft. in elevation.

Kashan. Town of Persia. The capital of the prov. of the same name, in Iraq-i-Ajam, it lies 120 m. S. of Teheran. The centre of a fertile region, it trades in silks, carpets, woollens, and rosewater. It was partially wrecked by an earthquake in 1895. Pop. 45,000.

Kashgar. Dist. in the extreme W. of China, bordering on the Pamirs and Karakoram Mts. In Sinkiang, it touches Kirghiz S.S.R., Tadzhik S.S.R., and Kashmir. The soil is fertile and contains a number of oases, but dust clouds are a feature of the climate. The chief products are cereals, rice, cotton, and fruit. Minerals have not been much worked, but jade stone is found. Kashgar is also the name of the chief place, which stands on the Kizil Daria, near the Kizil Yart Mts., at an alt. above 4,000 ft. It is the seat of the governor. The Chinese have built a new town 7 m.



Tamara Karsavina, famous Russian ballerina



Kashgar, Chinese Turkistan: A coffee house in the main street

away, but it remains little more than a fort. There is a trade agreement with the U.S.S.R. Most of the people are Mahomedans. *Consult* Kashgaria, A. N. Kuropatkin, Eng. trans. 1883.

Kashipur. Subdivision of the Kumaun division, Naini Tal district, Uttar union, India. Its many Hindu temples make it a resort of pilgrims. It is a trade centre between Central Asia and N. India. Ruins of an ancient city of the 7th century have been excavated. Area, 189 sq. m. Pop. 61,500, 60 p.c. Hindus.

Kashmir. State in the Himalaya mts. On its N. boundary China and Afghanistan meet. The upper Indus, with the Gilgit tributary, forms a valley stretching from the S.E. to the N.W. of the State. N.E. of this valley and parallel to it lie the Karakoram Mts., whence flow the Shyok and the Hunza; S.E. are the Himalayas, and S.W. of them the upper valleys of the Jhelum and Chenab.

The Jhelum valley is the famous vale of Kashmir, 80 m. long by 20 m. wide, overlooked by many peaks exceeding 20,000 ft. in alt.; there rice, buckwheat, and barley are grown. In the Indus area, Ladakh, Baltistan, Gilgit, and Hunza, most of the people

are nomad shepherds. Tiny plots are laboriously tilled for rice, buckwheat, millet, etc. Coal, limestone, gypsum, and iron are found. Fruit and hides are exchanged for textile and metal goods. Srinagar (*q.v.*) is the capital; Jammu, the winter capital.

Under Asoka (*q.v.*), who founded Srinagar, there began the "golden age" of Kashmir. It reached its height when the Kashmiris defeated the victorious advance of Mahmud of Ghazni in the 11th century. From 1819 to 1846 Kashmir was under the Sikh kingdom of Lahore; then the ruler of Jammu, Gulab Singh, a Dogra Rajput, took the side of the British and by a treaty signed at Amritsar acknowledged their supremacy and received the state of Kashmir, in respect of which he agreed annually to present two shawls. Kashmir forces served with distinction in both Great Wars.

After the partition of British India in 1947 the Hindu ruler of this predominantly Muslim state acceded, Oct. 27, to India. Serious fighting followed between Muslim tribesmen (assisted, according to India, by Pakistani troops) advancing from the W. and Indian troops advancing from the S.E. On Jan. 15, 1948, India brought the dispute before the U.N. security council, which set up a commission of mediation that visited Pakistan, India, and Kashmir, where it found Pakistani as well as Indian troops. On Aug. 14 it proposed a cease-fire and a truce, to be followed by consultations on holding a plebiscite; but it was the last minute of the year before a cease-fire came into effect. A truce line, negotiations over which were several times interrupted, was settled

by Nov. 3, 1949. The U.N. had appointed Chester Nimitz plebiscite administrator the previous March; India and Pakistan at last agreed, April, 1950, to accept Sir Owen Dixon, Australian judge, as mediator to organize demilitarisation preliminary to the plebiscite.

There are hydro-electric installations at Jammu, and an aerodrome (at Srinagar), but no rly. Area 82,258 sq. m. Pop. 4,021,616. See Cashmere; Jammu; Shalmar.

Kasimov. A town of the R.S.F.S.R. It is in the Moscow region, 75 m. E.N.E. of Ryazan, on the Oka, a tributary of the Dnieper. There are a cathedral and a mosque; tanneries, smithies, and boot and shoe factories; and trade is done in grain and cattle. The old name was Gorodetz.

Kaskaskia OR OKAW. A river of Illinois, U.S.A. Rising in Champaign county, it flows S.W. and enters the Mississippi. It is 300 m. long and navigable for 150 m. to Vandalia.

The township of Kaskaskia, with a pop. of 131, is on Kaskaskia I. which, situated between the new and the old main channels of the river, is the only part of Illinois W. of the Mississippi. Under the waters of the Mississippi, which flooded it in 1899, is the site of old Kaskaskia, the second of the French forts and settlements in this region. Founded in 1703, four years after Fort Cahokia, with which it had a parallel history for 100 years as a centre of French colonial life, it became the regional capital under the English and its capture, 1778, in the war of independence made possible the American acquisition of the Northwest Territory under the peace of 1783. It was the capital of the territory of Illinois and became the first state capital in 1818, declining after the seat of govt. was transferred to Vandalia the next year.

Kassala. Eastern prov. of the Anglo-Egyptian Sudan. It contains the districts of Butana, Hadendoa, Gallabat, Gedaref, Kassala, and Mafaza, and is crossed by the Atbara or Black Nile. Cotton and durra are grown, and there are gum forests. Area, 134,450 sq. m. Pop. 717,900.

Kassala. Town in the Anglo-Egyptian Sudan. Situated on the Cash, a tributary of the Atbara, it is about 260 m. S. by W. of Suakin. A rly., opened in 1924 from Thiam, on the Atbara-Port Suakin line, to Kassala, was extended to Sennar and Khartum, for the cotton trade. During the Second Great War, Kassala was occupied



Kashmir, or Jammu and Kashmir. Map of the state on the edge of the "roof of the world"

by the Italians from July 4, 1940 to Jan. 19, 1941.

Kassassin. Town of Egypt. It is situated on the canal between Ismailia and Zagazig, 21 m. W. of Ismailia, and was the scene of an action fought Aug. 28, 1882, in which the forces of Arabi Pasha were defeated by the British. It is on the rly. W. of Ismailia.

Kassel. German town noted as Cassel (*q.v.*).

Kassite. People of non-Semitic origin frequently encountered in Babylonian history. Casual immigrants bearing the cuneiform name Kashshi, apparently from Elam, were living in Babylon under Hammurabi, c. 2100 B.C. About 1780 Gandash founded the Third or Kassite dynasty, which ruled Babylon until 1200. Presumably of Altaian stock and agglutinative speech, their chief contribution to W. Asian civilization was the introduction of the horse. The aryanised mountaineers of the same name whom Sennacherib attacked in Media in 702 are the Kossaeans of later Greek writers. See Babylonian.

Kastamuni OR KASTAMBUL. Town of Asiatic Turkey. Situated on the Kara Su, a tributary of the Kizil Irmak, it is the capital of a vilayet of the same name, and lies about 35 m. from the Black Sea, and 75 m. S.W. of Sinöpe. It manufactures copper, leather, and cotton goods, and exports large quantities of mohair. Near it are copper mines. The area of the vilayet is 19,570 sq. m., largely wooded; pop. 384,109.

Kastoria. Lake and town of Greece. They are situated in the Florina dist. in Greek Macedonia, in the basin of the Vistritza, 27 m. S.E. of Koritza in Albania. The lake is 6 m. in length. The town is on the W. side.

Kasur. Subdivision and town of Pakistan, in Lahore district, Punjab. Kasur town is an important commercial centre, with trade in grain and cotton. Area of subdivision, 808 sq. m. Pop., subdivision, 414,499; town, 53,106.

Katabatic. Term applied to local winds which blow down relatively steep slopes. On a calm, clear night the ground loses heat to the sky by radiation, causing the air in immediate contact with it to be substantially cooled. The cold air gravitates down the sloping ground, the direction of flow being determined by orographical features. Should there be a hollow at the foot of the slope, the drainage forms a pool of cold air which is unable to escape

easily; its temperature may drop considerably below that over the surrounding flat ground. Striking katabatic conditions often occur after sunset in sheltered valleys which have been warmed more during the daytime than the adjacent open country; although the downward current is comparatively shallow, the katabatic flow may be quite strong. When the general wind remains fresh, or the sky cloudy, surface cooling by night is diminished and the katabatic effect either does not develop or is less marked.

This damming of cold air in valley bottoms produces in extremes "frost hollows." In a small but deep valley at 4,000 ft. in the Austrian Alps, winter temperatures of -60° F. have been registered, compared with -2° F. at the summit of the Sonnblick, 6,000 ft. higher. The classic example in the British Isles is near Rickmansworth, Herts, where the air has been chilled below freezing point even in July and Aug., minimum grass temperatures being at, or below, freezing for three-fifths of the year. Katabatic winds can produce dangerous frosts in late spring, when the prevention of damage to orchards presents a major problem. Heaters normally employed for protection against radiation frosts over flat country cannot cope with the continual flow of cold air; but hedges constructed diagonally across the slopes help to deflect katabatic winds. Avoiding frost hollows and slopes affected by these winds is probably the only way out. Katabatic winds are usually accompanied by mist or fog. Snow- or ice-covered surfaces, in the shade, cool rapidly and therefore favour their development during daylight. See Frost.

A. J. Drummond, F.R.Met.S.

Katabolism (Gr. *katabolē*, throwing down). Biological term indicating the changes which take place in living protoplasm during which highly complex substances are broken down through successive changes into simpler products, and may ultimately become waste products. Both chemical and physical processes are involved. The converse is anabolism, the two constituting metabolism. Both processes are continuous in living creatures. See Anabolism; Metabolism.

Kataghan. Part of the Afghan province of Badakshan (*q.v.*).

Katanga. Prov. in the S.E. of Belgian Congo, extending from N. Rhodesia to lat. 5° S. and from

Lake Tanganyika to long. 22° E. It is watered by the Lualaba (upper reaches of the Congo) and the rivers flowing into Lake Moero or Mweru. The country around Élisabethville, the administrative capital, is fertile and well watered, with numerous agricultural settlements; rice, palm oil, ground nuts, sugar, and coffee are produced, and cattle are raised.

Of the mineral riches of the Belgian Congo, copper, tin, uranium, radium, and cobalt are concentrated in the Katanga district. The copper deposits, together with those of N. Rhodesia, produce annually more than 500,000 tons. The ore bodies are bedded deposits of disseminated copper sulphides in pre-Cambrian sedimentary rocks. Cobalt is recovered as a by-product during metallurgical treatment of the copper ores in sufficient amount to make the Congo the world's largest producer, with over 800 tons yearly. It is generally accepted that the radium-uranium ores near Kambove are genetically related to the copper ores, and were formed by ascending magmatic solutions. These form one of the most important radium-uranium deposits in the world. Tin production from surface deposits has risen considerably.

Katanga is connected by rly. with Cape Town and Lobito Bay; a line runs N. to terminate at Port Francqui. An airport at Élisabethville is a station on routes to all the principal towns in the Congo, and to Rhodesia and Cape Town. The Lualaba is navigable from Kongolo to Bukama. With an area of about 180,000 sq. m., Katanga is divided into four administrative districts: Haut-Luapula, capital Élisabethville; Lomami (Kabinda); Tanganyika (Kongolo); and Lulua (Kafakumba). The white pop. is about 10,000, but the native pop. is scanty except for an area some 120 m. W. from Élisabethville along the Luapula. Consult Katanga, R. J. Cornet, 3rd ed. 1946.

Kater, HENRY (1777-1835). British scientist. Born April 16, 1777, he entered the army, went to India, and there helped to carry out valuable trigonometrical surveys. Returning to England, he took part in the trigonometrical survey of Great Britain, 1821-23, and in association with Arago, Mathieu, and others, determined the difference in longitude between Greenwich and Paris. For several years he carried out a series of experiments on the seconds' pendulum, for which he was awarded

the Copley medal of the Royal Society. He died in London, April 26, 1835.

Kater's pendulum is a compound pendulum having a knife-edge at each end and two masses which can be adjusted until the periodic time of vibration of the pendulum about either knife-edge is the same. By a theorem of Huyghens, the distance l between the knife-edges is equal to the length of an ideal simple pendulum with the same period τ . The acceleration due to gravity g may then be calculated from the formula $\tau = 2\pi\sqrt{l/g}$.

Katerina Harbours. Seaport of the R.S.F.S.R., in Murmansk region. Formerly Alexandrovsk, it is on the estuary of the Tuloma in Kola Bay, an inlet of the Arctic. Being ice-free, it was made a naval station in 1899; but its importance has been somewhat discounted by the opening of the port of Murmansk, about 30 m. S.

Katha. District of Upper Burma. Mainly hill country, it is for the greater part covered by forests. Cultivation is on a limited scale, rice, sesamum, tea, and tobacco being the chief crops. The mineral resources include gold, copper, iron, and lead. Timber and other forest produce is exported; piece goods and hardware are imported. Katha town on the Irawadi is the terminus of a short branch rly. from the line to Myitkyina. Of strategic importance, it fell to the British 36th div. on Dec. 10, 1944, in the Second Great War. Area of dist. 7,000 sq. m. Pop. 290,990.

Katharina. Character in Shakespeare's comedy *The Taming of the Shrew* (*q.v.*). She is the shrew of the title.

Kathiawar. Peninsula on the W. coast of India. It includes those former states which formed the Western Kathiawar agency, 1927-47, now the nucleus of the Saurashtra (or Kathiawar) union. The area of the region—including W. and E. Kathiawar—is 37,894 sq. m. About half the peninsula is under cultivation of cotton, millet, wheat, etc. Minerals include building stone and iron. Cotton is exported; imports include piece goods. Gandhi was born on the peninsula at Porbandar. Junagadh (*q.v.*) lies within the Kathiawar peninsula. Pop. 4,904,156.

Katmai. Volcano of Alaska, on the Alaska Peninsula, on Shelikof Strait opposite Kodiak Island. Katmai, 7,500 ft. high, was believed to be extinct until June 6, 1912, when, in a spectacular eruption, it blew its top off and

worked "one of the greatest geological changes to occur on the earth's surface in the memory of man," creating the Valley of Ten Thousand Smokes. An expedition in 1915 found that over a tract of 53 sq. m. all vegetation lay buried beneath incandescent sands. This and other active and quiescent volcanoes are included in the Katmai national monument.

Katmandu. Capital of Nepal. This is also spelt Khatmandu (*q.v.*).

Katowice or KATTOWITZ. The sixth largest town of Poland. Lying $7\frac{1}{2}$ miles S.E. of Beuthen (Bytom) in the industrial district of Upper Silesia, it is on the Dabrowa coalfield and engaged also in iron manufacture. It lies in that part of Silesia allotted to Poland after the First Great War. Overrun by the Germans in 1939, it was recaptured by Marshal Koniev Jan. 28, 1945, after being outflanked to the N. Pop. 128,278.

Katrine. Loch or lake of Scotland. It is almost wholly in Perthshire, with a little in Stirlingshire, and is 8 m. W. of Callander. About 8 m. long and less than one broad, it is 364 ft. above sea level, and covers nearly five sq. m. Its waters are carried by the Achray and the Black Avon through lochs Achray and Vennachar to the Teith, while from it Glasgow obtains much of its water. The loch is famous for the beauty of its surroundings, the Trossachs being close by. In the lake is Ellen's Isle, and its scenery is described in Scott's *Lady of the Lake*. See Ben Venue; Ellen's Isle; Trossachs.

Katsena. River of Nigeria. An important tributary of the Benue, it rises near the Cameroons frontier and joins the Benue a few miles above Abinsi. It is navigable for small craft during the rainy season as far as Katsena Allah.

Katsena or KATSINA. Town of Nigeria. It is 85 m. N.W. of Kano, in the Northern provs., on the road to the Sudan, and is the capital of the former independent sultanate of Katsena. The sultanate rose into prominence in the 17th and 18th centuries and was of importance until the Fula subdued the whole of Hausaland in the early part of the 19th century. In 1903 the sultan made his submission to the British.

Katshanik or KATCHANIK. Town of Yugoslavia. On the rly. from Skopje (Üsküb), 20 m. S.E., to the Kossovo plain, it gives its name to the Katshanik pass, between the Kara Dag and the Shar Dag ranges. During the First

Great War it was the scene of a desperate battle between the Serbian and Bulgarian armies, Nov. 10-15, 1915. Bulgarian forces which had occupied Üsküb were threatening to advance on to the Kossovo plain and roll up the Serbian armies from the S. The latter attacked at Katshanik pass, and though the Bulgarians ultimately obtained the victory, the delay was long enough to prevent destruction of the northern armies.

Kattegat or CATTEGAT. Wide arm of the North Sea, with which it is connected by the Skagerrak on the N. It lies between the E. coast of Jutland and the W. coast of Sweden, the islands of Funen (Fyen), Zealand, and Laaland (Maribo) lying to the S, with passages, called The Sound, Great Belt, and Little Belt, leading to the Baltic Sea. In length about 150 m. from N. to S., breadth from 50 to 90 m., depth ranging from 50 ft. in the W. to 200 ft. in the E., shallow near its shores, with shoals and sandbanks, the Kattegat is difficult of navigation. Its waters enclose the islands of Anholt, Samsö, and Läsö.

When the Germans invaded Norway and Denmark in April, 1940, the Allies counted on destroying a high proportion of enemy troop convoys as they crossed the Kattegat; but although British aircraft and surface and submarine units of the Royal Navy penetrated to the mouth of the Kattegat and attacked enemy shipping there, the effect on German operations was less than had been hoped. Throughout the Second Great War mines were laid in the Kattegat by British aircraft.

Kattimundoo or CATTIMANDOO (Telugu). Cement obtained from the milky juice of *Euphorbia Cattimundoo*, native of India and the East Indies. The dried juice is used to fasten knives into their handles, and generally to cement metal. It is also regarded in the East as a remedy for rheumatism.

Katunia Pillars. Name of a group of mountains in the Altai, in the West Siberian region, R.S.F.S.R. Its highest peak is the Bielukha.

Katwijk. Town of the Netherlands, in the prov. of S. Holland. On the coast 5 m. W.N.W. of Leyden, with which there is steam tramway and canal-boat communication, it is a popular seaside resort. The Katwijk canal is the last reach of the river Rhine, known here as the Oude Rijn, which flows into the sea through large gates, constructed in 1807.

These are closed as the tide rises, to prevent inundation. The town has a fair-sized herring fleet and good harbour. Pop. 15,700.

Katydid. The popular name for certain American long-horned grasshoppers. Their chirping note, supposed to resemble the words Katy did, is heard by day and night. See Grasshopper.



Katydid. Laurel leaf variety.
Microcentrum laurifolia

Kauai. Most northerly of the Hawaiian Islands. Of volcanic origin and circular, in shape, it has an area of 551 sq. m. and rises to about 6,000 ft. Forests abound, and the island is well watered and productive, sugar and fruits being cultivated. There are several good harbours. Pop. 35,636. The county of Kauai, consisting of the islands of Kauai and Niihau, has a pop. of 35,818. See Hawaii.

Kaufbeuren. Old German town near the Bavarian Alps, at an alt. of 2,000 ft. A rly. junction 47 m. W.S.W. of Munich, it has an airport; a free city from the 13th century to 1802, still partly walled, it has a huge basilica of the 15th century, S. Martin's, two other medieval churches, guild house, museum, and theatre. It is a centre of dairy produce, also of cotton and printing industries, sawmilling, and brewing. Pop., pre-war, 10,190—heavily increased from 1945 by the taking in of expelled Germans from E. and S.E.

Kauffer, EDWARD McKNIGHT (b. 1890). Anglo-American artist. Born at Great Falls, Montana, he became a scene painter in the theatre, and after studying art in Chicago, Munich, and Paris, settled in London in 1914. Designing book jackets and posters for the London Underground rly., he established his reputation as a decorative artist of outstanding originality, chiefly in blacks, greys, and pastel shades. His work is represented at S. Kensington and in Washington. An exhibition of his posters was held in New York in 1937, and the same year he contributed designs to the ballet Checkmate. He executed woodcuts, and illustrated Don Quixote and The Anatomy of Melancholy.

Kaufman, ANGELICA (1741–1807). A Swiss painter, usually classed with the English school. Born at Coire, Oct. 30, 1741, she acquired the rudiments of art from her father, a painter. From 1760 she studied at various centres in Italy, and in 1763 went to Rome,

where she devoted herself largely to history and allegory. In 1766 she came to London, her home for 15 years. She painted portraits of notabilities, fascinated Garrick, and was friendly with Reynolds.

Elected in 1768 one of the 36 foundation members of the R.A., to which she regularly contributed, she left London owing to

her father's failing health in 1781, in which year she married Antonio Zucchi, a Venetian painter and A.R.A. In 1782 she moved to Rome, where she resided for the rest of her life and died Nov. 5, 1807. She displayed exceptional skill in the decoration of the interiors of mansions designed by the brothers Adam.

Kaufmann Peak. The highest mt. in the U.S.S.R. It is in the Alai Tagh range, in Tadzhik S.S.R., to the N. of Lake Kara-kul, and its height is 23,386 ft. It is named after the Russian general Constantine Kaufmann (1818–82), who is associated with the conquest of Central Asia.

Kaulbach, WILHELM VON (1805–74). A German painter. Born at Arolsen, Oct. 15, 1805, he studied at Düsseldorf under Peter Cornelius, identifying himself with the Neo-Classical school.

Apollo among the Muses, 1826, in the Odeon of Munich, inspired high hopes, which were held to be fulfilled by the vast and pretentious Battle of the Huns, 1834–37, and Destruction of Jerusalem under Titus, 1839. In 1849 he was appointed director of the academy of Munich, where he died April 7, 1874. His best work is in his illustrations to Shakespeare, Goethe, and Schiller.



Angelica Kaufman,
Swiss painter
Self-portrait in the
Acad. S. Luca, Rome



W. von Kaulbach,
German painter
Self-portrait

Kaunas or KOVNO. Town of Lithuania S.S.R. It stands on the N. side of the river Niemen at its junction with the Viliya and a little above its junction

with the Jessia, 60 m. N.W. of Vilna. Founded in the 11th century, until the end of the 16th it was the great cereal mart of Lithuania, but the trade in grain, with that in timber, has greatly declined. The industries of Kaunas include breweries, bone grinding mills, and wire and nail factories. The university of Vytautas the Great was opened in 1922. The Austrians captured Kaunas during the First Great War after a week's intensive shelling, Aug. 17, 1915. When Germany attacked Russia in June, 1941, Kaunas fell to von Leeb's troops in the first week's fighting; the 3rd White Russian army under Chernyakhovsky retook it on Aug. 1, 1944, after a week's bitter fighting. Pop. 152,365.

Kaunitz, WENZEL ANTON DOMINIK, PRINCE VON (1711–94). Austrian statesman. Born at Vienna, Feb. 2, 1711, he travelled in Europe, and visited England before entering the diplomatic service. Between 1741 and 1746 he undertook missions to Rome, Florence, Turin, and the Netherlands. In 1748 he represented Austria at the congress of Aix-la-Chapelle which concluded the War of the Spanish Succession. As ambassador to France, 1750–53, he prepared the way for a diplomatic revolution, i.e. an alliance of France and Austria against Prussia, which as chancellor and foreign minister he effected in 1756. An able and enlightened minister, he was a power for good in his country, as well as the leading diplomatist in central Europe, during over 40 years of office, ending with his retirement in 1792. He died June 27, 1794.

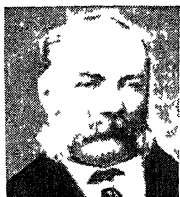
Kauri Pine (*Agathis australis*). Large tree of the family Coniferae. It is a native of New Zealand and Queensland. It stands 150 ft. high, with ovate lance-shaped leaves and smooth oval cones, much like those of the cedar. The timber is close-grained but soft, light yellow, and is used in joinery and cabinet-making, and in shipbuilding. The tree yields a hard, brittle resin, like dammar (*q.v.*). True dammar is produced by an allied species, the Amboyna pine (*A. dammara*), a native of the Moluccas.

Kava. Variant name for ava, an intoxicating drink made in the Sandwich Islands. See Ava.

Kavala or KAVALLA. Town of Macedonia, Greece. It is situated at the head of the gulf of the same name, in the N. of the Aegean Sea and opposite the island of Thasos. With a good harbour, it has in normal times a large tobacco trade. Its possession was one of the

causes of the second Balkan War, Bulgaria claiming it from Greece, to whom it was eventually given by the treaty of Bukarest, Aug. 10, 1913. The Bulgars held it from Aug., 1916, to almost the end of the First Great War. In April, 1941, Kavala was occupied by German troops, who invaded Greece from Bulgaria; in July they were replaced by Bulgarians. It was liberated when E. Thrace was evacuated by Axis forces in Oct., 1944. Here Mehemet Ali was born.

Kavanagh, ARTHUR MACMOROUGH (1831-89). Irish politician. The son of a landowner in co. Carlow, he was born March 25, 1831. He is remarkable because, although born with rudimentary arms and legs, he lived the active life of his class: he rode, hunted, and shot, and took a leading part in local affairs. From 1866 to 1880 he was a Conservative M.P. Kavanagh, who married and had a family, died Dec. 25, 1889.



Arthur Kavanagh,
Irish politician

Kavirondo. Negro tribes dwelling N.E. of the Victoria Nyanza, Africa. Extending from the W. Elgon slopes across the Nzoia basin towards the Yala river, they embrace two racial groups. The Nilotic tribes, 5 ft. 8 ins., exemplified by the Jaluo, migrated from the Nile provs. within the last 200 years. The Bantu-speaking tribes, 5 ft. 6½ ins., exemplified by the Wawanga, represent the most northerly range of Bantu influence. See Bantu.

Kavirondo Gulf. An inlet of the Victoria Nyanza, on the shore of Kenya. It is about 50 m. from W. to E. At the N.E. end is Kisumu, with rly. connexion with Nairobi.

Kawardha. Town and former state of central India, now part of the Madhya union. The town has a trade in locally grown cotton. Kawardha lies in the hilly area N.E. of Balaghat. Only a third of the area is cultivable; 83 p.c. of this is tilled, chiefly for pulses. Most of the people are Hindus. State area, 794 sq. m. Pop. 77,284.

Kawasaki. Industrial city of Japan, on the main electric rly. between Yokohama and Tokyo. In the outer city lies the historical Heiken-ji temple dedicated to Kōbō-Daishi (774-834), one of the founders of esoteric Buddhism in Japan. The temple was put up in the 12th century by a wealthy

fisherman and his son. Pilgrim trains are run on festival days, the 21st of Jan., March, May, and Sept. Extensive pear gardens in the district are noted. Pop. 218,000.

Kay. A knight of the Round Table in the Arthurian legends. He is frequently known as Kay the Seneschal, and is usually described as foster-brother to King Arthur. He is shown as a brave fighter in some of the stories, and in many, notably in Tennyson's *Idylls of the King*, as a sayer of bitter things. See *Morte d'Arthur*.

Kay, JAMES (1858-1942). A Scottish painter. He was born at Lamash, Arran, Oct. 22, 1858, the son of a naval officer, and received his training at the Glasgow School of Arts. He exhibited at the R.A. from 1889, at the Salon from 1894, and in the U.S.A. His principal works include *Une Rivière du Nord*, 1903, in the Luxembourg; *Winter*, 1906, and *Un Canal*, Écosse, 1909, at Rouen. Launch of the *Lusitania*, 1907 (Glasgow); *Launched—River Clyde*, 1907 (Leeds); *A Dutch Canal*, 1912 (Bradford). He died Sept. 26, 1942.

Kay, JOHN (1704-?64). English inventor. Born at Walmersley, Lancs, July 16, 1704, he patented in 1733 the flying shuttle. In spite of its instantaneous success Kay did not profit: he was involved in lawsuits, attacked in his home at Bury by workers fearful for their livelihood, and the manufacturers stole his invention, paying nothing. He died obscure and poor.

Kay, JOHN (1742-1826). A Scottish caricaturist. Born near Dalkeith, he was apprenticed to a barber, and followed this craft until 1785. Having long devoted his leisure to drawing portraits, he acquired a knack of catching likeness and character, although his technical equipment remained imperfect. He opened a shop in Parliament Close, Edinburgh, where he sold his own etchings of portraits he had drawn. All executed on a small scale, and embracing the best known men of his time, they were in steady demand. He died in Edinburgh, Feb. 21, 1826. His fame rests upon the posthumous edition of his plates, 1837-38.

Kayak. Eskimo fishing or hunting boat for one person, rarely used for two. A skin-covered wooden frame,

about 18 ft. long by 2 ft. wide, it is propelled by a double paddle, and can carry some 200 lb. besides the hunter. The occupant is encased in a skin coat laced to the canoe, which effectually protects him against the rough sea. See *Baffin Bay*; *Eskimo*.

Kayan. Primitive people of mongolised Indonesian stock in Sarawak and central Borneo. Estimated at 150,000, roundish-headed and wavy-haired, they may represent a medieval Karen migration from the Irawadi basin.

Kayasth or **KAYASTHA.** Indian caste of writers, chiefly in upper and eastern India, ranking next to the Brahmin in Bengal where this caste is most numerous. In Orissa it is known as *Karan*. Members have supplied the clerical and accountancy professions from time immemorial. They have risen high in the public service; the first Indian member of the viceroy's executive council (1910) was Lord Sinha of this caste, who was also the first Indian to become a peer and a privy councillor. Original members of the caste mostly adhered to saktism, the worship of the female principle. All observe *Dawat Puja*, the worship of the inkstand in honour of *Sarasvati*, goddess of learning, at the *Sri Panchami* festival on the fifth day of the Jan. new moon.

Kaye, DANNY. For biography of this American actor, see *N.V.*

Kayes. Town in French Sudan. It stands on the river Senegal, which during the rainy season is navigable to this point. A rly. runs through Kayes from Dakar to Kulikoro, on the Niger. Pop. 18,352.

Kaye-Smith, SHEILA. British novelist, born at St. Leonard's. She published her first novel, *The Tramping Methodist*, in 1908, and became known for studies of Sussex yeomen, shepherds, and smallholders—types then fast dying out. *Sussex Gorse*, 1916; *Tamarisk Town*, 1919; *Joanna Godden*, 1921; *The End of the House of Alard*, 1923; and *The History of Susan Spray*, 1931, were remarkable for

fidelity of character drawing and evocation of the town and countryside of East Sussex and Romney Marsh. Later books, like *The Valiant Woman*, 1938, were pervaded by a sense of fatalism, com-



Kayak. Skin-covered fishing boat used by Eskimos

bined with a strain of religious fervour. In 1924 she married the Rev. T. P. Fry.

Kayseri. Another form of the name of the Turkish city and vilayet Kaisariyeh (*q.v.*).

Kay - Shuttleworth. SIR JAMES PHILLIPS (1804-1877). A British reformer and politician. Born at Rochdale, July 20, 1804, he entered a bank, but left to study medicine. Graduating at Edinburgh, he practised in a poor district of Manchester, and became known as a social reformer. In 1835 he was made a poor law commissioner, and in 1839 secretary of the committee to administer the parliamentary grant for education. Born Kay, he took the surname of Janet Shuttleworth when he married her. He was made a baronet in 1850, and died May 26, 1877. In 1902 his son was created Baron Shuttleworth.

Kazakh OR KAZAKHSTAN. A republic of the U.S.S.R. Made a constituent republic on Dec. 5, 1936, it is bounded W. by the Caspian Sea and the R.S.F.S.R., N. by the R.S.F.S.R., E. by China (Sinkiang prov.), and S. by Kirghiz S.S.R. and Uzbek S.S.R., having an area of 1,072,797 sq. miles. Its capital is Alma-Ata, formerly Vyerny; pop. 230,528. Much of the territory is semi-desert and steppe, but there are fertile areas in the N., S., and E. Irrigation schemes were begun in 1944 on the Syr Daria in the Kizil Orda region. Grain, sugar beet, and cotton are important crops, and the country is famous for livestock, particularly sheep, which provide fine quality wool.

The republic is rich in minerals, coal, tungsten, oil, copper, lead, zinc, manganese, Iceland spar, nickel, and chromium all being found. A big deposit of iron ore was discovered in the N.W. in 1946. Industrial development has been rapid, commercial undertakings including smelting works, chemical and meat packing plants, fish canneries, and tractor works. The Trans-Kazakh trunk rly., connecting Petropavlovsk, Akmolinsk, Karaganda, and Lake Balkhash, is linked with the Turkestan-Siberian rly. Many new highways were begun in 1940. Kazakhs constitute more than half the pop. Russians and Ukrainians over a third, while Uzbeks live in the extreme S. Pop. 6,145,937.

Kazan. Capital of the Tatar A.S.S.R. of the R.S.F.S.R. Standing on the river Kazanka near its junction with the Volga, it is a flourishing river port, famous for

soap, toilet articles, and leather goods; while there are also machinery, textile, tobacco, and brewing industries. The city contains a university, several mosques and churches, and a kremlin founded in 1437. The brick Suyumbeka tower, a pyramidal structure 246 ft. high, is the reputed burial place of a Muslim saint. Pop. 401,665.

Kazan. River of Canada, in the N.W. Territories. It rises N. of the Saskatchewan border, flows through many lakes, of which Yathkyed is the largest, and discharges into Chesterfield Inlet, in the N.W. corner of Hudson Bay.

Kazanluk, KASANLUK, OR KEZANLIK. Town of Bulgaria. Situated in the valley of the Tunja, it is about 120 m. E. of Sofia, with which it is connected by a fair road, and 5 m. S. of the Shipka Pass. It has an extensive trade in otto of roses, the whole neighbourhood being given over to their cultivation. Pop. 11,598.

Kazbek. Mt. in the Central Caucasus, Georgia S.S.R. It is the third highest peak of the range, E. of the Dariel pass, and is an extinct volcano of conical form. Alt. 16,500 ft.

Kazembe OR CAZEMBE. Former native kingdom in Rhodesia. It lay S.E. of Lake Mweru, the chief settlement being about 22 m. S. of the lake. Old Kazembe, the former capital, was some 25 m. N.E. The country was first visited by the Portuguese traveller, F. J. M. de Lacerda (1750-98), who travelled from Angola. It is now divided between N. Rhodesia and the Belgian Congo.

Kazvin. A town of Persia. Standing upon one of the great caravan roads to the W., it lies 100 m. N.W. of Teheran, in the prov. of Kazvin. The town was occupied by British troops in 1918 in their march to the Caspian. At the outbreak of the Second Great War, it was the terminus of one of the branch lines of the Trans-Persian rly. Upon the Anglo-Soviet occupation of Persia, 1941, the line was extended to Tabriz and became a supply route for Allied war material sent to Russia. British and Russian forces met just S. of Kazvin, Aug. 31; the town remained in Russian hands until March, 1946. Pop. 60,000.

Kea (*Nestor notabilis*). A New Zealand parrot of the family Trichoglossidae. Formerly living upon fruit, seeds, and insect grubs, during a period of scarcity of its natural food, the kea took to haunting the sheep stations, and

was believed to attack healthy sheep. In fact, it is probably



Kea. A New Zealand parrot

search the kea may inflict appalling injuries on sheep.

It is somewhat larger than the kaka (*q.v.*), of a general olive-green colour, the feathers with a black margin, and the wings and tail varied with blue and yellow. In summer it inhabits the rugged slopes of the mountains, but in winter visits the lowlands, where the sheep appear to be safe from its attacks. Its nesting habits are similar to those of the kaka.

Kean, CHARLES JOHN (1811-68).

British actor. Born at Waterford, Jan. 11, 1811, the second son of

Edmund Kean, he was educated at Eton. He played Iago to the Othello of his father at Covent Garden in the performance at which the latter was seized by his fatal illness



Charles John Kean. British actor

(March 25, 1833). Kean produced at The Princess's from 1852 to 1859 a series of gorgeous revivals. He made his first appearance as Young Norval in Douglas at Drury Lane, Oct. 1, 1827, and his last as Louis XI at the Theatre Royal, Liverpool, May 28, 1867. He died Jan. 22, 1868.

Kean, EDMUND (1787-1833).

A British actor. He was born in London, March 17, 1787, the son of Anne Carey, an actress and descendant of the marquess of Halifax. Neglected by his mother until he reached a money-making age, in the course of a boyhood and youth of adventure and hardship he played childish parts, appeared as a ventriloquist and circus acrobat, having both legs broken in a tumbling feat, and recited before George III at Windsor. At Gloucester, 1808, he married Mary Chambers (*d.* 1849), a Waterford actress. After undergoing much privation in the provinces, at Dorchester he



Edmund Kean

After the painting by S. J. Stump, in the National Portrait Gallery

attracted the notice of the stage manager of Drury Lane Theatre, who offered him a three years' engagement, seeing in him a likely successor and rival to Kemble (*q.v.*), who had left Drury Lane for Covent Garden in 1802, to the great detriment of the former house. On Kean's arrival in London, his refusal to appear in a secondary part aroused the opposition of the Drury Lane management, and his memorable and triumphant début in the part of Shylock, Jan. 26, 1814, was achieved in a house that received him first of all with chill indifference. Success also attended his appearances as Richard III, Hamlet, Othello, Lear, and Macbeth. Wolsey, Brutus, Coriolanus, and King John were less suited to his genius; but he achieved popularity as Sir Giles Overreach in Massinger's comedy *A New Way to Pay Old Debts*, as Leon in Beaumont and Fletcher's *Rule a Wife and Have a Wife*, Young Norval in Home's *Douglas*, and Rolla in Sheridan's *Pizarro*. He visited the U.S.A. in 1820 and 1825.

Regarded when at the height of his powers as the greatest tragedian of his day, to see him, said Coleridge, was like reading Shakespeare by flashes of lightning. Byron, Hazlitt, and other critics paid eloquent tribute to his genius. In 18 years his salary was believed to have averaged £10,000 a year, but his recklessly intemperate habits and love of display broke his health and involved him in his later years in poverty and distress. For long intervals he deserted his wife, maintaining an extravagant mansion in Scotland in the

company of an unworthy mistress. Nevertheless his wife claimed to have remained loyal to him throughout, and did much to maintain his self-respect during his many periods of public unpopularity. Small in stature, he had a fine head, flashing eyes, and a voice of a rare magnetic quality. His temper was all but ungovernable, but he was a generous friend. Taken ill at Drury Lane, during a performance of *Othello*, just after he had uttered the words, "*Othello's occupation's gone*," March 25, 1833, he was removed to his house at Richmond, where he died May 15. He was buried in Richmond churchyard. *See* Lives, Barry Cornwall, 1835; F. W. Hawkins, 1869; J. F. Molloy, 1888; H. N. Hillebrand, 1933; G. Playfair, 1939.

Kean, ELLEN (1805–80). British actress, born in Ireland, daughter of a govt. official named Tree. She made her first public appearance at Covent Garden, 1823, as Olivia in *Twelfth Night*, and her début at Drury Lane, Sept. 23, 1826, as Violante in Mrs. Centlivre's *The Wonder*. At Covent Garden she created the parts of Mariana and the Countess in Sheridan Knowles's two plays, *The Wife and Love*; and played Romeo to Fanny Kemble's Juliet. She visited the U.S.A. in 1836–39; married Charles Kean, Jan. 29, 1842, and appeared with him in Shakespearean parts at The Haymarket and in his revivals at The Princess's. Her Shakespearean repertoire included Viola, her favourite part; Ophelia, Rosalind, Constance, Lady Macbeth, Queen Katharine, Gertrude, and Hermione. She retired in 1868, and died Aug. 20, 1880.

Keane, DORIS (1881–1945). An American actress. Born in Michigan, Dec. 12, 1881, she was educated in Chicago, New York, and Paris. She made her first appearance on the New York stage in 1903, and in London in 1907. In 1913 she appeared most memorably in *Romance* as Margherita Cavallini, playing opposite Owen Nares. Later plays included *Roxana*, 1918; *Czarina*, 1924. She died in New York, Nov. 26, 1945.

Kearny. Town of New Jersey, U.S.A., in Hudson co. Situated at the head of Newark Bay between the Passaic and Hackensack rivers, it is opposite Newark, adjoins Harrison, and is 9 m. W. of New York. It is served by rlys. Leading manufacturers have plants in Kearny, whose commercial advantages include a 10-m. waterfront. There are shipyards, oil

refineries, and plants making machinery, chemicals, varnishes, and shoes. Many of the people are descendants of Scots who came to work in textile mills and established cooperative enterprises. Originally called New Barbados in 1668, the site was permanently settled by Germans in 1765. The township of Kearny was formed out of Harrison in 1867, and incorporated in 1895. Pop. 39,467.

Kearny, PHILIP (1815–62). An American soldier. Born in New York, June 2, 1815, he was educated at Columbia university, and studied law. In 1837 he entered the army, and soon went to France. He crossed to Algeria and served there with the French forces. Again in the U.S.A., he led cavalry in the war against Mexico, 1846, and fought in an Indian war. In 1859 Kearny was once more in Europe, fighting as a volunteer for France in Italy. When the Civil War began he joined the Federal army and was soon at the head of the cavalry of the army of the Potomac. He was at Williamsburg and the second battle of Bull Run. On Sept. 1, 1862, he was killed at Chantilly.

Kearsley. An urban district of Lancashire, England. It is 4 m. S.E. of Bolton, and has a railway station. The chief industries are connected with coal mines in the neighbourhood, while cotton, paper, and bricks are made. The Bolton corporation and the Irwell Valley water board supply the district with water. Here is the chief generating station of the former Lancashire Electric Power co. Market day, Mon. Pop. 9,736.

Kearton, CHERRY (1871–1940). A British naturalist. Born at Thwaite, in Swaledale, Yorks, July 8, 1871, he became known as a pioneer of animal photography, employing this medium to illustrate the books of his brother Richard. He produced some of the earliest films of animal life, including striking studies of big game, and won a reputation as a lecturer. His books include *Wild Life Across the World*; *The Animals Came to Drink*, 1932; *Adventures with Animals and Men*, 1935; *I Visit the Antipodes*, 1937. A collected vol., *Cherry Kearton's Travels*, appeared 1942. Died Sept. 27, 1940. His



Cherry Kearton.
British naturalist

brother Richard (1862-1928) was the first to write with accuracy in a popular manner on ornithology. Born Jan. 2, 1862, he died Feb. 8, 1928.

Keate, JOHN (1773-1852). English schoolmaster. He was born at Wells, the son of a clergyman, was educated at Eton and King's College, Cambridge, and became a master at his old school. In 1809 he was chosen headmaster, a post he held until 1834. Under him the tone of the school greatly improved but he is best remembered for the vigorous floggings he inflicted on bad boys. A clergyman, he held from 1820 a canonry at Windsor; and the living of Hartley Westpall, Hants, from 1824 until his death there, March 5, 1852.

Keats, JOHN (1795-1821). English poet. He was a Londoner, son of the manager of a livery stable, The Swan and Hoop, Finsbury Pavement. The eldest of five children, John was born Oct. 29 or 31, 1795. He went to school at Enfield, and found a friend in Charles Cowden Clarke (*q.v.*), son of the schoolmaster; he was remembered by his fellows for generosity, pugnacity, and a passion for reading. He lost his father by a riding accident in 1804, and his mother in 1810. Then he was apprenticed by a trustee to a surgeon in Edmonton. In 1815 he came to London, lodged in the Borough and Cheapside, and having passed his examination at Apothecaries' Hall, attended lectures at Guy's. At that hospital in 1816 he was appointed a dresser. But having the necessary means, and already the acquaintance of Leigh Hunt, Hazlitt, Haydon, Shelley, and Godwin, he abandoned surgery for literature.

Through the kindness of Hunt, several sonnets by Keats appeared in *The Examiner*. But *Poems*, 1817, which, with all its immaturities, included the sonnet *On First Looking into Chapman's Homer*, fell dead from the press. It was followed in 1818 by the long narrative, *Endymion*, attacked savagely for political reasons by *The Quarterly Review* and *Blackwood's Magazine*. Exposure during a walking tour in Scotland and the strain of nursing his brother Thomas, who died in December, brought about a breakdown in health. This was aggravated by the misery of his unrequited passion for Fanny Brawne.

Keats published only one more volume, *Hyperion and Other Poems*, 1820. This contains his great contributions to literature: the fragmentary title-piece; *The*

Eve of S. Agnes; the splendid odes *To Autumn*, *To a Nightingale*, *On Melancholy*, and *On a Grecian Urn*; and the ballad, *La Belle Dame sans Merci*. By this time consumption had definitely declared itself. As a lost hope, in Sept., 1820, accompanied by his friend Joseph Severn (*q.v.*), he left England for Italy. At Lulworth he wrote his last sonnet, "Bright Star, Would I were Steadfast as thou art." He died in a house in the Piazza di Spagna, Rome, Feb. 23, 1821, and was buried in the Old Cemetery. Conscious to the last, and attended with rare devotion by Severn, he chose his own epitaph, "Here lies one whose name was writ in water."

If the place of Keats is among "the inheritors of unfulfilled renown," much of his work being



John Keats

After William Hilton, R. A.

rich in promise rather than in achievement, yet no other English poet has ever undergone so great development within so brief a period. Further evidence of the steady ripening of his mind appears in his letters, which are invaluable.

Keats's attitude towards poetry was that of the pure artist; poetry should be not the vehicle of philosophy or social theories, but simply the embodiment of beauty; it should be "great and unobtrusive," for "with a great poet the sense of beauty overcomes all other considerations, or rather obliterates all consideration." Nothing in his verse suggests the didacticism of Wordsworth, the iconoclasm of Byron, or the utopianism of Shelley; for him "a thing of beauty is a joy for ever," and the creation of beauty was his one absorbing aim. His love of

nature is intense, but there is nothing mystical or religious about it; it is a love of sensuous beauty both for its own sake and as a symbol of spiritual things.

In this objectivity he exhibits his "natural affinity" with the Greek spirit—an affinity that was entirely instinctive and was not (as in Landor and Swinburne) reinforced by scholarship. But the Hellenic element blended in him with the romantic—*e.g.* *The Eve of S. Agnes*—and in the luxuriance of his style, which rarely attains the temperance of classic art, and in his fondness for rich decorative detail in the manner of his Elizabethan models, he is romantic even when handling Greek themes. Young as he died, he was one of the most germinal poets, and left a deep mark on English literature.

The first memorial to the poet was unveiled in the parish church of Hampstead (*q.v.*) on July 16, 1894, a bust sculptured by a Boston lady and presented by Americans. In 1909 the house in which Keats died was opened as a Keats-Shelley memorial. In connexion with centenary celebrations a movement was started which in 1925 acquired Lawn Bank, formerly Wentworth Place, Hampstead, where Keats lived during 1817-20, as a home for the Dilke collection of relics. There the poet is said to have heard the nightingale of the Ode. The Keats museum was opened in 1931.

Bibliography. Collected Works, ed. H. B. Forman, 1883; *Poems*, ed. G. T. Drury, intro. R. Bridges, 1896; *Life, Letters, and Literary Remains*, ed. Lord Houghton, 1867; *Letters*, ed. M. B. Forman, 1947; *Letters to Fanny Brawne*, ed. H. B. Forman, 1878; *Lives*, W. M. Rossetti, 1887; S. Colvin, 3rd ed., 1921; B. Askwith, 1941; *Autobiography*, compiled by E. V. Weller, 1934; *Keats and His Poetry*, W. H. Hudson, 1911; *Studies in Keats*, J. M. Murry, 1930; *Keats and the Victorians*, G. H. Ford, 1945.

Keble, JOHN (1792-1866). British divine and poet. Born at Fairford, April 25, 1792, he was the son of the vicar of Coln St. Aldwyn. He was educated at Corpus Christi College, Oxford, afterwards becoming a fellow of Oriel. In 1815 Keble was ordained, and in 1816 became curate of two small parishes near his native place.

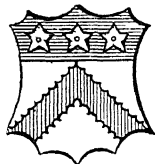


John Keble

In 1827 he published anonymously his most famous work, *The Christian Year* (*q.v.*). Familiar are his hymns, *Sun of my soul, Thou Saviour dear*; and *The voice that breathed o'er Eden*.

Keble was professor of poetry at Oxford, 1831-41, the lectures which he delivered being published in Latin in 1841 and translated in 1910. Identified with the Oxford Movement (*q.v.*), which had its origin in a sermon on national apostasy preached by him at Oxford in 1833, he contributed four to the series of *Tracts for the Times*. In 1846 he published *Lyra Innocentium: Thoughts in Verse on Children*. From 1836 he was vicar of Hursley, near Winchester, until he died at Bourne-mouth, March 29, 1866. He was buried at Hursley. Keble College, Oxford, was founded as a memorial. See *Hursley*; consult *Lives*, J. T. Coleridge, 1869; W. Lock, 1893; Lord Irwin, 1932; *Musings Over the Christian Year*, C. M. Yonge, 1871.

Keble College. One of the colleges of Oxford university. Founded in 1870 as a memorial to John Keble, it is in full association with the university, and has the special object of providing normal university education under the influence of the Church of England. The college has rooms for 150 students. Internal administration is in the hands of a warden and fellows, and there is a college council. The buildings are in Parks Road; designed by William Butterfield, they include a magnificent chapel, the gift of William Gibbs, in which Holman Hunt's *Light of the World* (see illus. p. 4370) is preserved.



Keble College arms

Kecskemet. Town of Hungary, on the Alföld, 50 m. S.E. of Budapest. A typical garden city, famous for its apples and its annual cattle fair, it has tanning, soap, and wine making industries. It is the chief rly. junction between Budapest and Szeged. It was captured by the Russians, Nov. 1, 1944, after violent street fighting. Pop. 83,732.

Kedah. Small principality adjoining Siam on the N.W. coast of the Malay Peninsula. By treaty with Siam, Kedah came under British suzerainty in 1909. It is bounded S. by the Krian river, and comprises the basins of the Kedah and Mada rivers, having its E.

boundary along the watershed of the Central mts. of the peninsula. Rice, rubber, coconuts, and tapio-ca are produced. Alor Star, the chief place, is on the rly. between Singapore and Bangkok; it lies 59 m. N. of Penang. Area, 3,660 sq. m. Pop. 515,758.

Kedge Anchor. Small anchor, weighing in the naval service from 3 cwt. to 16 cwt., according to the



Kedge Anchor, used for light work

type of ship to which it is supplied. It is used to alter the position of a vessel without raising steam for the purpose. The anchor is cast in the desired spot from a small boat, and the ship brought up to it by hauling on the cable. In the days of sailing ships it was by continuous kedging that the U.S. frigate *Constitution* escaped from a British squadron in July, 1812, the British ships being unable to kedge because their small boats out ahead with the anchors would have come under the fire of the enemy's guns. An older spelling is *catch anchor*. See *Anchor*.

Kedleston. Village of Derbyshire, England. It is 4 m. N.W. of Derby. Here is Kedleston Hall, the seat of the Curzons, and until his death in 1925 of the Marquis Curzon. Standing in a large park, it was built 1759-68 in the classical style. The Curzons have lived here since about 1100.

Keeble, SR FREDERICK WILLIAM (b. 1870). A British botanist. Educated at Dulwich



Keble College, Oxford. Interior of the magnificent chapel
Frith

and Caius College, Cambridge, he became in 1908 editor of the *Gardeners' Chronicle*. Keeble was honorary director of the Royal Horticultural Society gardens at Wisley, 1914-19, and controller of food production at the board of Agriculture from 1917, becoming in 1919 its assistant secretary. He was Sherardian professor of botany at Oxford, 1920-27, and Fullerton professor, Royal Institution, 1938-41. In 1920 he married the actress Lillah McCarthy (*q.v.*), and in 1922 was knighted. Publications include *Plant Animals*, 1901; *Practical Plant Physiology*, 1911; *Science Lends a Hand in the Garden*, 1939.

Keel (A.S. *ceol*, a ship). Small undecked vessel propelled by oars and at one time common in the North of England. The term still describes the barges carrying coal on the Tyne; hence the old measure, a keel of coal—21 tons 4 cwt., also the old Tyneside song, *Weel may the keel row*. In certain districts of England any open receptacle made of wood, like a bucket or milk pail, is called a keel.

The term is now more generally applied to the lower longitudinal beam at the bottom of a ship, answering to the spine. From the keel the ribs for the framework of the hull are built up. A false keel is an extra, weighted keel placed below the main keel to strengthen the ship and increase its stability. A sliding or drop keel, frequently fitted to sailing vessels, consists of a flat board fitted amidships and extending from the deck to the bottom of the main keel; it is held in grooves and is lowered to prevent a vessel making leeway when sailing in a beam wind. See *Navigation*; *Ship*.

Keeler, JAMES EDWARD (1857-1900). American astronomer. Born at La Salle, Illinois, Sept. 8, 1857, he studied at Johns Hopkins and German universities and became an assistant at Lick Observatory in 1886. In 1898 he was made its director, and he died Aug. 12, 1900. Keeler was distinguished by his researches in spectrum analysis, and furnished in 1895 spectroscopic proof that the rings of Saturn are a dense collection of small particles. The proof consisted in showing that the velocities of different parts of the ring varied, being greater the nearer the planet was approached. He took photographs of nebulae, thereby greatly increasing the existing estimate of their number, and demonstrating that at least half of them were spiral.

Keeley, MARY ANN (c. 1805–99). British actress, born at Ipswich. Her maiden name was Goward. In 1829 she married Robert Keeley (1793–1869), a popular comedian. She made her début at The Lyceum, 1825, as Rosina in the comic opera of that name, and long before her retirement in 1859 achieved a reputation as one of the most delightful comedienues of her time. In Shakespeare her parts included Audrey, Nerissa, Maria in *Twelfth Night*, Dame Quickly, and Mrs. Page. She was appreciated by Dickens as Smike in a dramatised version of Nicholas Nickleby, 1838; and took the lead in Buckstone's drama, *Jack Sheppard*. During the management by her and her husband of the Lyceum, 1844–47, the theatre became famous as a home of burlesque and parody. She died March 12, 1899.

Keelhauling. Punishment formerly inflicted in the British and other navies. The man sentenced to it was hauled by ropes and tackle, attached to the yard-arms, from one side of the vessel to the other, beneath the keel. Only awarded for serious offences, the punishment often resulted in death.

Keeling Islands. Group in the Indian Ocean, belonging to Great Britain, officially known as the Cocos Islands (*q.v.*).

Keene. City of New Hampshire, U.S.A., the co. seat of Cheshire county. On the Ashuelot river, it is 44 m. S.W. of Concord, and is served by the Boston and Maine rly. and an airport. Surrounded by mts. rising to 1,500 ft., Keene is noted for beautiful scenery and homes and is a tobogganing and skiing centre. There are railway repair shops, mica quarries, textile mills, and manufactures of shoes, chairs, machinery, and toys. Settled by emigrants from the Massachusetts Bay Colony under a grant of 1733, it was incorporated under its present name in 1753 and made a city in 1873. Pop. 13,832.

Keene, CHARLES SAMUEL (1823–91). English illustrator. Born at Hornsey, Middlesex, Aug. 10, 1823, he entered the office of his father, a solicitor, then that of an architect, and finally the studio of the brothers Whymper, the wood engravers. He began to work inter-



Charles Keene



Country Gentleman (who thought he'd got such a treasure of a new gardener): "Tut, tut, tut! Bless my soul, Saunders! How—what's all this? Disgracefully intoxicated at this hour of the morning! Ain't you ashamed of yourself?"

Saunders: "'Shamed! (hic) Na, na, 'm nae sae drunk as that comes t'! Ah ken verra well what a'm about!" (*Punch*, Oct. 8, 1870.)

Charles Keene. Example of the work he contributed to *Punch*

mittenly for *Punch* in 1851, and from 1860 was a full member of the staff. He illustrated books in general literature as well, such as Jerrold's *Mrs. Caudle's Curtain Lectures*. But his brilliant work on *Punch* constitutes his title to fame. He was one of the finest draughtsmen in black and white ever known, with a great sense of character and an unusual combination of strength and delicacy. He died in London, Jan. 4, 1891. *Consult* Charles Keene, D. Hudson, 1947.

Keep. In architecture, the stronghold and residential part of a medieval castle in time of siege. The Norman square keep was the highest of the castle buildings, and generally occupied the highest site. It was entered at the level of the first floor, the ground floor or basement being used as a store-house, and access to the upper chambers was gained by a narrow spiral staircase. The hall was on the second storey, and the upper storey contained small sleeping rooms built into the massive walls, and other domestic apartments.

Another type of keep was the "shell" keep, a polygonal or round structure found in castles which occupied the sites of old defensive works, i.e. Saxon or Norman earthworks or timber buildings. The function of the shell keep, like that of the square, was to serve as a stronghold in case of necessity. It was, however, entirely surrounded by its own ditch, across which was carried a drawbridge, which linked up the structure with the main castle courtyard. The most notable extant

example of the square keep is the White Tower of the Tower of London (*q.v.*), while the shell keep is worthily represented at Windsor, Arundel, and Warwick castles. *See* Architecture; Castle; Donjon; Hall.

Keewatin. Former district of Canada, now divided between Ontario, Manitoba, and the North-West Territories (*q.v.*). The name is connected with Cree, the north-west wind. The territory, as it was called, stretched from the Arctic down to the old frontiers of Ontario and Manitoba, and was bounded on the E. by Hudson Bay and on the W. by the 100th meridian. Its area was 445,000 sq. m. In 1905 the district, was included in the N.W. Territories; in 1912 parts of it were added to Ontario and Manitoba. It still gives its name to a dist. in the N.W. Territories covering 228,160 sq. m.; also to a diocese.

Keewatin. In geology, a series of rocks of early Pre-Cambrian age found in Canada and S. and W. of Lake Superior, U.S.A. The series is mainly composed of ancient altered lavas which vary from basalt to rhyolite, the former predominating, with associated beds of tuff or volcanic ashes. Its base has not been definitely recognized, and its top grades upwards into sediments. The whole group has been extensively invaded by later granites and gneisses. Keewatin rocks are important because in them occur gold-bearing veins of the Porcupine and other gold and copper fields of Canada. *See* Pre-Cambrian.

Keeweenawan. Series of rocks of Pre-Cambrian age occurring S. and N. of Lake Superior, U.S.A. and Canada, named after the Keeweenaw peninsula on the lake. The series contains a thick group of basaltic lavas and conglomerates carrying valuable deposits of nearly pure native copper.

Kef, EL (Arab., the rock). Walled town of Tunisia. It is picturesquely built on a rock, 125 m. by rly. S.W. of Tunis. It is the ancient Sicca Veneria, was founded by a colony of Phoenicians, and has numerous Roman remains.

Kehl. Town of Baden, Germany, on the right bank of the Rhine at the limit of navigability, opposite Strasbourg. It was French during 1678-97 and 1808-14, and French-occupied 1919-25 and from 1945. Important as a fortress until 1918, and as a river port, it had wood-pulp and chemical industries. The pop. of 12,000 was entirely evacuated in the Second Great War, and replaced from 1945 by 7,000 French settlers and officials; some German inhabitants were allowed to return in 1949.

Kei or **EWAN ISLANDS.** Small group of islands in E. Indonesia. They lie near the South-Eastern Is., Aroe Is., S.E. of Ceram and W. of New Guinea. The largest is Great Kei, where mts. exceed 3,000 ft. *Pron.* Kay.

Keighley. Mun. bor. and industrial town of Yorkshire (W. Riding), England. It is 9 m.



Keighley arms

N.W. of Bradford and 17 m. of Leeds, with a rly station, being also served by a canal. The chief buildings are the church of S. Andrew, rebuilt in the 19th century, the municipal institute, a technical college, art school, public library, and museum. A grammar school for boys dates from 1713. Keighley manufactures woollen and worsted goods, sewing machines, textile machinery, gas engines, etc. Harworth, a place of pilgrimage for admirers of the Brontë family, lies within the borough boundaries. Keighley gives its name to a bor. constituency. Market day, Wed. Pop. est. 55,700. *Pron.* Keethly.

Keijo. Japanese name for Seoul (q.v.).

Keitel, WILHELM (1882-1946). German soldier. Born Sept. 22, 1882, at Gandersheim, near Brunswick, he entered the army in 1901. He was an artillery commander during the First Great War, and



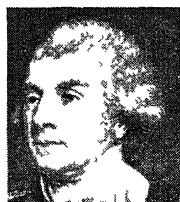
Field-marshal Keitel signing German's surrender, May 8, 1945

was promoted major-general in 1934. In 1938 he succeeded Blomberg as chief of staff. In that capacity he directed all German military operations from the rape of Czecho-Slovakia in March, 1939, until the unconditional surrender, May, 1945. He signed the armistice with France at Compiègne in June, 1940, and was promoted field-marshal in July. A signatory of the ratification in Berlin, May 8, 1945, of Germany's unconditional surrender, he was one of the major war criminals brought before the international tribunal at Nuremberg in November. (See Nuremberg Trials.) He was found guilty, Oct. 1, 1946, and executed Oct. 16.

Keith. Burgh and market town of Banffshire, Scotland. It stands on the Isla, 53 m. by rl. N.W. of Aberdeen. It consists of three parts, Old Keith and New Keith on the right bank of the river, and Fife Keith on the left. The manufactures include tweeds, blankets, and agricultural implements; there are distilleries. Pop. 6,082.

Keith, GEORGE KEITH ELPHINSTONE, VISCOUNT (1746-1823).

British sailor. Born Jan. 7, 1746, he entered the navy in 1761 and served in the Mediterranean. He proceeded to New York in the *Perseus*, 1776, returning to England, 1780, to be elected M.P.



Viscount Keith, British sailor

for Dumbartonshire. At Toulon in 1793 he distinguished himself. Dispatched in command of the expedition which captured Cape Town, in 1796 he defeated the Dutch fleet, and was made an Irish baron in 1797. Successfully dealing with the mutiny at Spithead, 1797, he was sent to the Mediterranean, 1798, where he took part in the attack on Egypt. He was given a peerage of the U.K. Promoted admiral in 1801, he was

commander-in-chief in the North Sea in 1803, in the Channel in 1812, and two years later was made a viscount. He died March 10, 1823.

Keith, SIR ARTHUR (b. 1866). British scientist. Born at Old Machar, Aberdeen, Feb. 5, 1866, he was educated at Aberdeen, London, and Leipzig. In 1899 he became secretary of the Anatomical Society of Great Britain, and was president of the Royal Anthropological Institute 1912-14. From 1917 to 1923 he was Fullerian professor of physiology at the Royal Institution; and Hunterian professor at the Royal College of Surgeons from 1908 to 1933, when he retired to take charge of the Buckston Browne research farm at Downe. He was knighted in 1921. Elected F.R.S. in 1913, he was secretary of the Royal Institution, 1922-26, and treasurer 1926-29.

Keith's presidential address to the British Association in 1927



Sir Arthur Keith, British scientist

aroused controversy by his denial of man's soul and his declaration that individual man had no more future than a note drawn from a violin string. A prolific lecturer and writer on embryology, morphology, and anthropology, he published *Introduction to the Study of Anthropoid Apes*, 1896; *Human Embryology and Morphology*, 1901; *Antiquity of Man*, 1915 and 1925; *Engines of the Human Body*, 1925; *Religion of a Darwinist*, 1925; *New Discoveries Relating to the Antiquity of Man*, 1931; and *Essays on Human Evolution*, 1946. His autobiography appeared in 1950. Keith contributed the article *Man* in this Encyclopedia.

Keith, ARTHUR BERRIEDALE (1879-1944). Scottish Oriental scholar. Born April 5, 1879, he was educated at Edinburgh university and Balliol College, Oxford. Called to the bar, 1904, he served in the Colonial Office from 1901-14, when he became regius professor of Sanskrit and comparative philology at Edinburgh, a position he retained until his death, Oct. 6, 1944. He wrote *Sanskrit Drama*, 1924; *History of Sanskrit Literature*, 1928; and two vols. on *Religion and Philosophy of the Veda and Upanishads*. He also lectured from 1927 on the constitution of the British Empire.

Keith, JAMES FRANCIS EDWARD (1696-1758). Scottish soldier. A younger son of William Keith, 9th earl marischal, he was born at Inverurie near Peterhead, June 11, 1696. He was educated for the law, but became a soldier. He served as a Jacobite in the rising of 1715 and in the expedition of 1719, spending the intervening time abroad. About 1721 he entered the Spanish service, from which he passed, 1728, into that of Russia; in campaigns against the Turks and the Swedes he made his military reputation. In 1747 Keith joined the Prussian army, and later he was in charge of the siege of Prague, and fought at Rossbach, Leuthen, and other battles. On Oct. 14, 1758, he was killed at Hochkirch. Frederick the Great made him a field-marshal. A man of literary tastes, he wrote a Memoir, 1714-34, published in 1789 and 1843.

Kekulé, AUGUST FRIEDRICH (1829-96). German chemist. Born at Darmstadt, Sept. 7, 1829, he studied chemistry at Giessen and Heidelberg. He afterwards came to London as a demonstrator in chemistry at S. Bartholomew's Hospital medical school, and there formulated his brilliant closed ring theory (announced 1865) of the composition of organic chemicals. Kekulé became professor of chemistry at Ghent, 1858, and in 1865 was transferred to Bonn, where he died June 13, 1896.

Kelantan. State of the Malaya Fedn. Adjoining Siam on the N.W., with a short coast on the China Sea, it came under British suzerainty in 1909 by treaty with Siam. It consists almost entirely of the basin of the Kelantan river. Kota Bharu, the capital, stands near the mouth of the river and on a rly. Many of the peaks rise above 5,000 ft. The jungle yields resin, rattan, and bamboo, while rice, rubber, and numerous fruits and nuts are cultivated. Gold, tin, iron ore, and manganese are extracted. Kelantan, which is ruled by a sultan, ranked until 1945 as one of the unfederated Malay states (*cf.* Johore). Area, est. 5,720 sq. m. Pop. est. 390,332.

Kellaways Rock. In geology, a subdivision of the Oxford Clay or lowermost stage of the Middle Oolite. It consists of clays and calcareous sandstones, and contains many fossils. The Kellaways Rock or Beds are found chiefly in Somerset, in Northants, and in Yorkshire, particularly at Scarborough, Gristhorpe, Hackness, and Kewpick.

Keller, GOTTFRIED (1819-90). A Swiss author. Born at Zurich, July 19, 1819, he studied art at Munich, and published in 1846 some short poems, the success of which gained him an allowance from the municipality to study at Heidelberg. Thence he moved to Berlin, where he produced *Der Grune Heinrich*, 1851-53, and *Die Leute von Seldwyla*, 1856, the latter a collection of short stories. Returning to Zurich, he held a post in the civil service, 1861-76. Upon his retirement he resumed writing short stories, *Zuricher Novellen*, 1878, and *Das Sinnedicht*, 1881, being the best. He died July 15, 1890. Keller combined fancy with realism, sincerity with wit, and had a distinctly lyrical gift.



Gottfried Keller,
Swiss author

Keller, HELEN ADAMS (b. 1880). American blind deaf mute. Born at Tuscumbia, Ala., June 27, 1880, she was deprived when 19 months old of sight, speech, and hearing, by an attack of scarlet fever. At 7 she was entrusted to the care of Anna Sullivan

(now Mrs. Macy) of the Perkins Institute of the Blind, Boston, who taught her to read Braille and soon to speak. At Radcliffe College, Boston, she graduated with honours in 1904. Her literary achievement would have been remarkable for a normal person, and in 1936 she received the Roosevelt Medal. Her books include *The Story of My Life*, 1902; *The World I Live In*, 1908; *The Chant of the Stone Wall*, 1910; *Out of the Dark*, 1913; *Midstream—My Later Life*, 1930. Her Journal appeared in 1938.



Helen Keller, American blind deaf
mute, at work in her study

Kellermann, FRANÇOIS CHRISTOPHE (1735-1820). French soldier. Born in Strasbourg, May 28,

1735, in 1752 he entered the French army, Alsace being then French. He served during the Seven Years' War, and had reached high rank when the Revolution broke out. Given a command in the republican army, he was responsible for its victory at Valmy, Sept. 20, 1792. Like others of that time, he had changes of fortune; at one time he was commanding an army in Italy, and at another was in prison. When too old for active service, he held high commands at home; in 1804 he was made a marshal, and in 1809 duke of Valmy. A man of moderate views, he supported the Bourbons after 1814, and was made a peer, dying Sept. 23, 1820.

Kellermann, FRANÇOIS ÉTIENNE (1770-1835). A French soldier. Son of the above general, he was born at Metz, Aug. 4, 1770, and became a soldier in 1793. His father's influence and his own abilities made his rise rapid, and he made a reputation as a cavalry leader in Italy in 1796-97. He was responsible for the charge that helped to decide the day at Marengo, and fought at Austerlitz, and afterwards in the Peninsula. His last service for Napoleon was at Waterloo. In 1820 he succeeded his father as duke of Valmy. He was opposed to the Bourbon rule, although he remained in France, dying June 2, 1835. Kellermann enriched himself in various doubtful ways. His son, François Christophe (1802-68), also duke of Valmy, was a statesman and writer.

Kellgren, JOHAN HENRIK (1751-95). A Swedish poet. Born Dec. 1, 1751, son of a pastor in Vestergotland, he distinguished himself at the university of Abo (now Turku), where he became lecturer on aesthetics. Moving to Stockholm, in 1778, he started the well-known newspaper, *Stockholms-Posten*. Afterwards he became librarian, and later private secretary, to Gustavus III, and was an original member of the Swedish Academy. He died at Stockholm, April 20, 1795. Kellgren wrote poetical dramas, lyrics, etc.

Kellogg, FRANK BILLINGS (1856-1937). An American diplomatist. Born Dec. 22, 1856, at Potsdam, N.Y., he became a lawyer, and was widely known as prosecuting counsel for the state, especially in the case against the Standard Oil company. Elected to the senate in 1916, he was U.S. ambassador to Great Britain

1923-25, and secretary of state under Coolidge, 1925-29. The pact (*v.i.*) under which nations renounced the use of war was due to his efforts, and he was awarded the Nobel peace prize in 1929. From 1930 to 1935 he was a judge of the permanent court of international justice at The Hague. He died Dec. 21, 1937.

Kellogg Pact. An international agreement intended to abolish war. It was concluded in Paris, Aug. 27, 1928, on the initiative of Frank Kellogg, American secretary of state, and Aristide Briand, French foreign minister. In due course nearly all the leading nations expressed their adherence, declaring "that they condemn recourse to war for the solution of international controversies and renounce it as an instrument of national policy in their relations with one another." A reservation was made by Sir A. Chamberlain on behalf of the British government that no interference could be suffered in "certain regions of the world the welfare and integrity of which constitute a special and vital interest for our safety."

Kells. Urban dist. and market town of Meath, Ire. It stands on the Blackwater, about 30 m. by rly. N.W. of Dublin. Its many antiquities include S. Columba's House, a round tower, and several stone crosses. There is a modern church, with an old detached bell tower rebuilt in 1572. Kells, known once as Ceanannus and later as Kenlis, owes its fame to the fact that the kings of Ireland made it a royal residence. In the 6th century S. Columba founded here a monastery in which the book of Kells (*v.i.*) was written. The house called by his name was originally an oratory. Kells was the seat of a bishop from 800 to 1300. Made a corporate town in the 14th century, it was governed by a sovereign, provosts, and 24 burgesses. It sent two members to the Irish parliament. The town has a long connexion with the family of Taylor, now represented by the marquess of Headfort. Market day, Sat. Pop. of rural dist. 10,855. There are other places of the same name in cos. Antrim, Kerry, and Kilkenny.

Kells, Book or. Finest extant early Irish illuminated MS. of the Gospels. Dating from the 8th century, it is now in Trinity College, Dublin. It includes three portraits of the evangelists, and three scenes from the life of Christ. Profusely illustrated, its minute interlaced Celtic ornament is of exquisite

beauty. Its book-shrine (Cumdach) is lost. See Manuscripts.

Kelly or **KELLEY**, **EDWARD** (1555-95). An English alchemist. Born at Worcester, Aug. 1, 1555, and educated as an apothecary, he studied at Oxford, became a scrivener or attorney in London, and began to write on alchemy. In 1580 he had his ears cropped at Lancaster for fraud. Two years later, at Mortlake, he met Dr. Dee (*q.v.*), and became his skyrer or medium. In 1583 a Polish nobleman, Albert Laski, took Dee and Kelly to Poland, where the latter professed to transmute mercury into gold. Dee and Kelly visited Prague, but Kelly was discredited, and was cast into prison Dec., 1589, to Oct., 1593. After a vagrant life in Germany, he died Nov. 25, 1595, of a broken leg caused by attempting to escape from confinement. He is referred to in Dekker's *Gull's Hornbook*, Jonson's *Alchemist*, and Butler's *Hudibras*.

Kelly, EDWARD (1854-80). An Australian bushranger. Familiarly known as Ned Kelly, he was the eldest of three sons of an ex-convict. In April, 1878, their home near Greta, Victoria, was raided in connexion with a charge of horse-stealing brought against Daniel Kelly. Edward, who had already spent three years in prison for the offence named, took to the hills, together with Daniel. Joined by others of equally loose character, the Kelly brothers inaugurated a reign of terror in Victoria and New South Wales, varying their cattle-thefts by burning banks and government property. They often

escaped being shot by protecting their bodies with rudely constructed iron armour.

A reward was offered for their capture, and on June 27-28, 1880, at a wooden "hotel" known as Jones's, in the little township of Glenrowan, 6 m. from Greta, the gang was rounded up. The building was set on fire, two of the gang perished in the flames, one was shot dead, and Ned Kelly, who refused an opportunity to escape, was wounded and captured. Tried and convicted, in Oct. he was hanged. See Boldrewood, R.; Bushranger; consult *The Last of the Bushrangers*, F. A. Hare, 1891.

Kelly, SIR GERALD FESTUS (b. 1879). A British portrait painter. He was educated at Eton and Trinity Hall, Cambridge. Exhibiting regularly at Burlington House, he was made R.A. in 1930, and served on the Royal Fine Art Commission, 1938-43. His state portraits of George VI and Queen Elizabeth in 1945 aroused interest. Knighted that year, he became P.R.A. in 1949. His work is at the Tate and other galleries. He painted many portraits of his wife.

Kelmscott Press. A private printing press founded by William Morris (*q.v.*). Started in 1890 in the Upper Mall, Hammersmith, in a cottage adjacent to Morris's residence, Kelmscott House, it was removed in 1891 to Sussex House near by. Of the types used, Golden was based on a 15th century model of Nicolas Jenson; Troy and Chaucer were Gothic. In seven years 53 works in 65 volumes were produced, including *The Story of*



Book of Kells. Facsimile of illuminated miniature and initial of the early Irish MS. described as "the most beautiful book in the world"



Kelmscott Press. Page from "The Works of Geoffrey Chaucer," printed in the "Chaucer" type designed by William Morris, and published by him at the Kelmscott Press. The illustration is by Sir Edward Burne-Jones; the border and initial by William Morris

the Glittering Plain, and reprints of Chaucer's Golden Legend and Recuyell of the Histories of Troy. Decorative initial letters and wood-cuts from designs by E. Burne-Jones were features, and the books were planned in accord with the idea that the unit must be the double page.

The wood blocks were deposited at the British Museum on the understanding that no one was to use them again for 100 years. The plant, exclusive of the type, passed to C. R. Ashbee, founder of the Essex House Press, which, with the Doves Press, founded by Emery Walker and Cobden Sanderson; the Adhendene Press, founded by St. John Hornby; the Vale Press; and the Caradoc Press, helped to carry on Morris's ideal of beautiful printing. The house was named after Kelmscott, Oxon,

where Morris lived 1871-96 and is buried. See Printing; consult Life of W. Morris, J. W. Mackail, 1899.

Keloid. The term keloid or cheloid is applied to a scar which, instead of contracting and becoming bloodless, remains vascular and tends to extend along the skin, somewhat after the fashion of a claw (Greek *kelis*). The condition is due to some chronic bacterial infection having found its way into the wound. Keloids are often associated with burns or scalds; or with insect bites. They also tend to occur in any scar in individuals of tuberculous tendency. Treatment consists in the application of radium or X-ray, and the results are reasonably satisfactory.

Kelowna. Town of British Columbia, Canada, on Okanagan Lake, 80 m. S. of Sicamous. The terminus of the C.N.R. line

from Kamloops, and of the C.P.R. from Sicamous, it is in the heart of the fruit-growing region of the Okanagan Valley. All public utilities are municipally owned. Pop. 6,700.

Kelp. Name given to the slag or ash obtained by burning seaweed, and also to the seaweed itself. In France the seaweed is known as *varech*, and the ash as *cendres de varech*. Kelp production was formerly an important industry in the West Highlands of Scotland, and is still carried on there to a small extent; it was introduced into the Scilly Isles; and is practised in Normandy.

From kelp are obtained soda and potash salts and iodine. At one time the object was to obtain the soda salts for use in glass-making, but the introduction of soda made by the much cheaper Le Blanc process entirely displaced kelp soda. Later the potash salts and iodine were the objects of kelp burning, these salts being separated by lixiviation. The cheaper production of iodine from caliche or Chile saltpetre and the competition of natural potash salts virtually extinguished the kelp industry in Great Britain before the First Great War. There is collection of kelp on Scottish islands to provide raw material for producing iodine. See Iodine; Potash.

Kelp-Fish. A family (Clinidae) of fishes having jugular pelvic fins and belonging to the Blennioid group of fishes. See Blenny.

Kelpie. Spirit in Scottish folklore. It was supposed to haunt fords and streams, especially in the form of a horse, on stormy nights, and to be either malignant in itself or a warning apparition to those about to be drowned. See Folklore.

Kelso. Market town and police burgh of Roxburghshire, Scotland. It is 52 m. S.E. of Edinburgh, on the railway, at the confluence of the Teviot and the Tweed. The chief buildings are the town hall, Tait hall, public library, and corn exchange. The grammar school is the successor of one at which Scott was educated. There are a public park and a race-course. Kelso is an important agricultural centre, with corn and cattle markets, and an annual ram fair. It has manufactures of agricultural implements and corn mills, and is visited by anglers. The early importance of Kelso was



Kelso arms

due to its abbey, founded about 1120 by David I. This became one of the greatest religious houses in Scotland, but was dissolved at the Reformation. Much of the cruciform church, including the great central tower, remains. In 1919 the ruins were given to the nation by the duke of Roxburghe, whose family had owned them since about 1600. Kelso was made a burgh in 1634. Near are Floors Castle (*q.v.*), the seat of the duke of Roxburghe, and the site of the former town of Roxburgh (*q.v.*). Market day, Fri. Pop. 4,279.

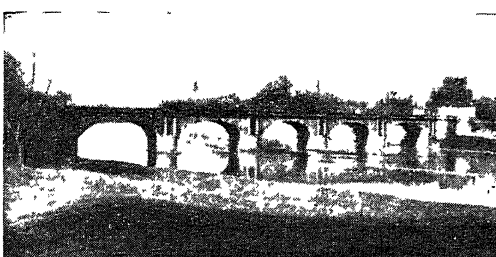
Kelt. Alternative spelling of the name of the people (Gr. *Keltai*) also known as Celts (Lat. *Celtae*). See *Celt*.

Kelty. Town of Fife, Scotland. In the parish of Beath, 8 m. by rly. N.E. of Dunfermline, it is the centre of a mining district. Pop. 6,800.

A river of this name, tributary to the Forth, forms part of the boundary between Stirlingshire and Perthshire.

Kelvin. A river of Scotland. Rising in the Kilsyth Hills, it flows into the Clyde near Partick, after a course of 21 m., largely through the urban districts W. of Glasgow. It gives its name to the chief public park of Glasgow, Kelvingrove, which lies on its sloping banks and is known also as the West End Park. Kelvingrove was laid out in 1852, and contains the corporation art galleries and, on Gilmore Hill, the buildings of Glasgow university (*q.v.*); its area is 91½ acres; it gives its name to a parl. constituency of Glasgow. Kelvinghaugh is a dist. of Glasgow, containing the Queen's docks, and Kelvinside and Kelvindale are residential quarters. See *Glasgow*.

Kelvin, WILLIAM THOMSON, BARON (1824-1907). British physicist. Born in Belfast, June 26, 1824,



Kelso. Bridge across the Tweed, and the Abbey church (right), seen from Maxwellthugh

1846 was appointed at 22 professor of natural philosophy at Glasgow, a chair he held for 53 years.

The next few years were devoted to thermodynamics. He engaged in controversy over the age of the earth, and put forward his absolute scale of temperatures (see *Kelvin Scale*). But in the realm of electricity and magnetism he was to make his name. In 1854 he published his paper *On the Theory of the Electric Telegraph*; in 1856 came his invention of receiving messages, the mirror galvanometer; and in 1857 he helped to lay the first Atlantic submarine cable. During 1857-79 Thomson was consulted upon almost every submarine cable enterprise, patenting the siphon recorder in 1867 and other inventions. That year appeared his paper *On Vortex Atoms*, one of the most remarkable theories of matter ever put forward.

There is scarcely an electrical instrument which was not perfected by Thomson. The household meter recording consumption of electricity is due to him. He suggested the necessity for determining electrical standards; he investigated the discharge of the Leyden jar; his work encouraged Hertz, the inventor of wireless telegraphy. From 1873 he vastly improved the mariner's compass. He evolved instruments for recording tides and tables for calculating position at sea. From designing a new water tap to determining the heat of the earth's crust, his mind ranged over the fields of practice and theory. A great experimenter, he said he could understand nothing of which he could not make a model.

The famous lectures on Molecular Dynamics and the Wave Theory of Light were delivered at John Hopkins university in 1884. Thomson had just received the Copley medal of the Royal Society; in 1890 he became its president. Knighted in 1866, he was raised to the peerage in 1892, and made a member of the Order of Merit at its inception in 1902. After his

retirement he went on working at electrical problems until his death Dec. 17, 1907. Though twice married, he left no heir to his title. Kelvin published more than 300 papers, especially *Popular Lectures and Addresses, 1889-94*. Lives and studies of his work are by A. Gray, 1908; S. P. Thomson, 1910; H. N. Casson, 1930. The name kelvin is sometimes used for a unit of energy equal to one kilowatt-hour.

Kelvin Scale, OR ABSOLUTE SCALE. Register of temperature which does not depend upon the particular thermometric substance employed. It is based on the fact that the efficiency of an ideal heat engine does not depend upon the working substance or the particular mechanical device adopted. If H_1 is the energy received from the hot source and H_2 the energy given up to the cold reservoir, then the respective temperatures T_1 and T_2 in the Kelvin scale are defined by $H_2/H_1 = T_2/T_1$. The result agrees fairly closely with the gas (hydrogen) scale of temperature (see *Thermometer*). The freezing point of water, 0°C. , is 273.1°K.

Kelvin's Law. Theorem enunciated by Lord Kelvin to fix costs in electrical engineering. This law states that the most economical section of a feeder, cable, or other conductor of electrical power is that which makes the annual cost of losses calculated from the square of the current multiplied by the resistance, equal to the annual interest on the capital cost of the conductor plus an annual allowance for depreciation. In practice, it is used as a guide rather than a set formula.

Kemal, MUSTAFA. The maker of modern Turkey is entered under the surname he adopted, Atatürk.

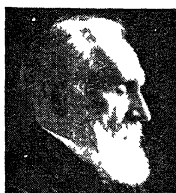
Kemble, ADELAIDE (c.1814-79). British singer and writer. Second daughter of Charles Kemble, the

actor, she studied singing and appeared in public in 1835. After performing in Paris she visited Italy; there she took further lessons and sang in Venice, and also at Covent



Adelaide Kemble, British singer After J. H. Wright

Garden and elsewhere in England until her retirement at the end of 1842. In 1843 Miss Kemble married Edward Sartoris, and later lived much in Rome. She



Kelvin Russell

Ken, THOMAS (1637–1711). English prelate. He was born at Berkhamsted, the son of a lawyer,



Thomas Ken,
English prelate

and was educated at Winchester and Hart Hall, Oxford, remaining at the university as tutor at New College. In 1662 he was ordained, and he held livings in Essex, the Isle of Wight, and Hampshire until 1672. Then he was engaged in clerical work in Winchester, and in 1679–80 was at The Hague as chaplain to Mary, princess of Orange. In 1685 he was made bishop of Bath and Wells, but was deprived in 1691 as a nonjuror. He lived in retirement until his death at Longleat, March 19, 1711.

Ken touched public life at many points. He was one of the seven bishops who refused to read the Declaration of Indulgence, and later one who refused to take the oath to William and Mary, thus nonjuring his bishopric. He refused to let Nell Gwynn inhabit his house at Winchester, but was with Charles II when he died. Above all he is known as the writer of the two hymns, *Awake my soul and with the sun, and Glory to Thee, my God, this night*. See *Nonjurors*, *Seven Bishops*; consult *Life*, E. H. Plumptre, 2nd ed. 1890.

Kenath. Hebrew word signifying possession. It was given to a city of Manasseh on the E. of Jordan (Num. 32, v. 42; 1 Chron. 2, v. 23). It is usually identified with Karawat, 16 m. N. of Bozrah, where there are some ruins; but this is not quite certain.

Kenchester. Village of Herefordshire, England. It is near the Wye, 5 m. above Hereford, and is the site of the Romano-British town of Magna Castra. Excavations made in 1912–13 revealed a street 30 ft. wide, houses with mosaic pavements, hypocausts, lead drains, Samian ware, and 334 coins. Succeeding an earlier British camp on the Caerleon-Wroxeter road, it reached its zenith A.D. 301–350.

Kendal. Mun. bor. and market town of Westmorland, in full, Kirkby-in-Kendal. Kendal was originally the name of a barony. It stands on the Kent, 21 m. N. of Lancaster and 251 m. N.W. of London, and has a railway station. The chief buildings are the Gothic church of Holy Trinity,

dating in part from the 13th century, town hall, market house, free library, and museum. There is a grammar school dating from 1525, but in a modern building. The principal manufactures are woollen goods, boots and shoes, agricultural machinery, paper, snuff, and tobacco. There are horse and cattle fairs.

Kendal grew up round a castle built before 1066. This was long the property of the family of Parr, and in it Catherine Parr was born; some ruins still remain. Kendal became a corporate town, and received several charters. Its early prosperity was due to the introduction of the woollen manufacture by Flemings, probably in 1330. It elected an M.P. during 1832–85. Market day, Sat. Pop. 17,700.

Kendal, DUKE OF. English title now extinct. It was given in 1667 to a son of the duke of York,



Duchess of Kendal,
German adventuress

afterwards James II, but he died an infant. Earlier there had been various earls of Kendal, usually members of the royal family. The title is chiefly associated with Ehrengard Melusina (1667–1743), mistress of George I, who created her duchess of Kendal in 1719.

Born at Emden, Dec. 25, 1667, daughter of the count of Schultenburg, she held an appointment in the household of Sophia, electress of Hanover, of whose son George she became mistress in 1690. She followed him to England in 1714, and established great influence over him. Lampooned, owing to her thinness, as the Maypole, and disliked for her greed, which inspired Swift's *Draper Letters*, she



Kendal, Westmorland. The parish church of Holy Trinity
Frith

yet retained her position until the king's death, and had two daughters by him, one of whom was created countess of Walsingham and became the wife of the earl of Chesterfield. The duchess died at Kendal House, Isleworth, May 10, 1743.

Kendal, DAME MARGARET (1849–1935). A British actress, whose early successes were won in her maiden name



Dame Margaret
Kendal,
British actress

of Madge Robertson. Born at Cleethorpes, March 15, 1849, a sister of T. W. Robertson, the dramatist, she made her London début, July 29, 1865, as Ophelia at The Haymarket, where she also first revealed her rare sense of comedy in *New Men and Old Acres*, 1874. At the old Prince of Wales's she showed power of pathos in *Peril*, 1876, and *Diplomacy*, 1878; and during 1879–88 she displayed her wide emotional range in plays at The St. James's under the Hare and Kendal management, more particularly *The Squire*, *The Ironmaster*, and *Clancarty*. Her greatest triumph in her later years was in *The Elder Miss Blossom*. She married W. H. Kendal in 1869; retired 1908; was created D.B.E., 1926; wrote her autobiography, 1933; and died Sept. 14, 1935. Consult *The Kendals*, T. E. Pemberton, 1900.

Kendal, WILLIAM HUNTER (1843–1917). British actor-manager, whose real name was William Hunter Grimston. Born Dec. 16, 1843, he made his first appearance at the Soho (Royalty) Theatre, April 6, 1861. During 1862–66 he acted at the Theatre Royal, Glasgow, with Charles Kean and his wife, Helen Faucit. From 1879 to 1888 he managed The St. James's in association with John Hare, supporting Mrs. Kendal as leading man. He retired in 1908 and died Nov. 7, 1917.

Kendall, HENRY CLARENCE (1841–82). Australian poet. Born at Ulladulla, New South Wales, April 18, 1841, he was a clerk in a solicitor's office and in the civil service. He turned to journalism first in Sydney and later in Melbourne. For a time he was inspector of forests in New South Wales. His first volume, *Songs and Poems*, 1862, so dissatisfied him that he sought to suppress it. Other volumes were *Leaves from an*

Australian Forest, 1869; and Songs from the Mountains, 1880. He died at Redfern, near Sydney, Aug. 1, 1882.

Kendrapara. Subdivision and town in India, in Cuttack district of Orissa. Situated in the Mahanadi delta, Kendrapara town is a trade centre. Area of subdivision, 977 sq. m.

Kenealy, EDMUND VAUGHAN HYDE (1819–80). An Irish lawyer. Born in Cork, July 2, 1819, he was educated there and at Trinity College, Dublin. In 1840 he became a barrister, and in 1847 was called to the bar in England. He came into notice when counsel for Orton, the Tichborne claimant, in 1873.



He conducted the case in a violent and unprecedented manner, and continued his vendetta against the judge, Sir Alexander Cockburn, after the trial. In 1874 he was removed from the roll of barristers. To right the supposed wrongs of himself and his late client, he started The Englishman, and in 1875 was successful in being returned to parliament as M.P. for Stoke. He lost his seat early in 1880, and died in London, April 16.

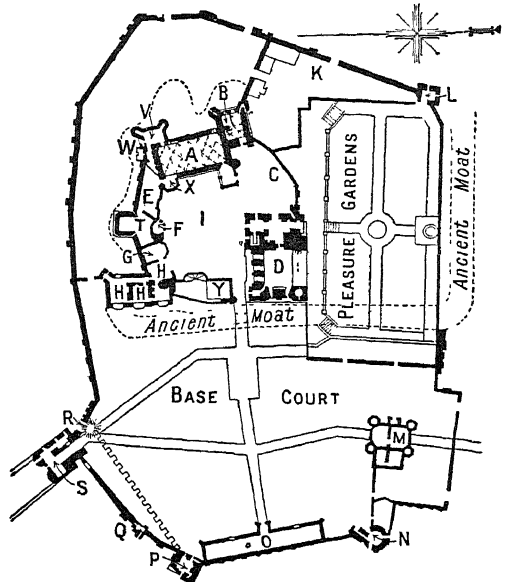
Keneh, QENA, QINA, OR KENA. A province and town of Upper Egypt. The province contains the districts of Dishna, Esna, Luxor, Nag Hamadi, Kosseir (Qosseir), and Qus. The town is 414 m. S.S.E. of Cairo, on the rly. which follows the right bank of the Nile. From Keneh a caravan route goes to Kosseir on the Red Sea, and another, which passes the emerald mines of Gebel Sebara, leads to Berenice (q.v.). Porous water bottles are manufactured here. Area of prov., 705 sq. m. Pop., prov., 1,017,569; town, 34,431.

Kenfig. An ancient town of Glamorganshire, Wales. It stands on the coast, 6 m. W. of Bridgend. The English settlers built a castle here, and before the 16th century it was a municipality and a market town. It was partly destroyed by the sea about 1700, but for some time it remained a borough with its portreeve and recorder. Kenfig Pool is a lake near.

Kenilworth. An urban district and residential town of Warwickshire, England. It is on an affluent of the Avon, 4 m. N. of Warwick,

with a rly. station. With a pop. of 7,952, its interest is purely historical. The name is conjectured to be derived from Kenulph, king of Mercia, 795–819. Domesday records that Richard the forester held land in Chinewrde. There is no evidence that any fortification existed until in about 1115 Henry I gave the manor in feudal tenure to his chamberlain, Geoffrey de Clinton. The latter founded the castle, the ruins of which are among the most considerable of their kind. On the south of a slight promontory, it was defended by moats and by brooks, dammed to form a lake of 111 acres, thus protecting those sides. Geoffrey or his son built the great keep, the curtain wall of the inner bailey, the barbican, and these water defences.

The castle, the present walls of which enclose the outer bailey, making about 7 acres, was added to by Henry II, John, and Henry III. In 1254 it was granted to Simon de Montfort. In the barons' wars, it was captured by Henry III, Dec. 21, 1266, after a six months' siege. The Ban or Dictum of Kenilworth embodied terms offered to the garrison on Oct. 31. The king granted it to his younger son Edmund, and it remained a Lancastrian stronghold, so that Henry IV brought it back to the crown in 1399. John of Gaunt had built the Strong Tower (Scott's



Kenilworth. Plan of the castle ruins. A. Banqueting Hall. B. Strong Tower. C. Site of kitchen. D. Caesar's Tower. E. White Hall. F. Lobby and stair to G. Privy Chamber. H. Leicester's Buildings. I. Inner Court. K. Pleasaunce. L. Swan Tower. M. Gate House. N. Lunn's Tower. O. Stables. P. Water Tower. Q. Room in wall. R. Head of water passage from lake. S. Mortimer's Tower. T. Tilt Yard. V. Recess at upper end of Great Hall. W. Stairs to Vaulted Chamber. X. Sir Robert Dudley's Lodging. Y. Henry VIII's Lodging.

Mervyn Tower), the banqueting hall, and the White Hall. Additions were made by Henry V, Henry VIII, and Robert Dudley, earl of Leicester, upon whom in 1562 it was conferred by Elizabeth. The queen visited the castle in 1566, 1568, 1572, and 1575.

After the Civil War most of the castle was ruthlessly dismantled; but Sir. W. Dugdale made a drawing of it as it stood in 1649. On the Restoration the property passed to the son of the earl of Clarendon, and ruins and manor descended in the family of the earls until sold in 1937 to J. D. Siddeley, Lord Kenilworth. He gave the ruins to the nation and they are maintained by the office of works.

The parish church of S. Nicholas, several times restored, has a broach spire and Norman W. door. Priory remains include a fine arched gatehouse of the 14th cent., with porter's lodge and another building of the same period, perhaps a guest house, now a museum of relics. The rest of the dormitory, the infirmary, and two drainage tunnels were traced and covered



Kenilworth Castle ruins, Warwickshire, showing Caesar's Tower on the right

again. Abbey Fields, the site of the precincts of the priory, now form a tract of about 70 acres in the middle of the town. In the vicinity are Stoneleigh Abbey, Baddesley Clinton, and Maxstoke with moated castle and Augustinian priory, both founded by Sir William de Clinton, earl of Huntingdon, the castle 1346, the priory 1337. See Barons' War; consult Kenilworth Castle, Knowles, 1872.

Kenilworth. A novel by Sir Walter Scott. The thirteenth of the Waverleys, it was published in Jan., 1821. In it Scott combines the story of Elizabeth's reception at Kenilworth with the tragedy of Amy Robsart (*q.v.*), and, giving a vivid portrait of the Virgin Queen, paints her favourite, Leicester, in the blackest colours. In addition to the gaiety and splendour of the court scenes, and the meeting between the queen and the unhappy Amy, the households of Leicester and his rival Essex are happily described. The novel has been many times dramatised.

Kenley. Part of the Coulsdon and Purley urban district, Surrey, England. It lies 15 m. S.E. of London, by railway or by Green Line. All Saints' Church dates from 1872. Kenley Common is the property of the corporation of the city of London, but part was acquired by the air ministry in 1916. The airfield, base of fighter squadrons during the Second Great War, was heavily bombed in 1940. Pop. 4,500.

At a village of this name in Shropshire, 4 miles W. of Much Wenlock, S. John's church dates from Saxon times.

Kenmare. Market town of co. Kerry, Eire. Near the head of the Kenmare river, which is crossed by a suspension bridge, and the terminus of a branch of the Eire state railways, it is a favourite tourist centre, with trout and salmon fishing, boating, bathing, and golfing. The chief places of interest include the R.C. church of the Holy Cross, the convent of the Poor Clares, public library, and, near by, Dun-

kerron Castle, the old home of O'Sullivan More; Derreen, a residence of the marquess of Lansdowne; and the field of Callan, where, in 1261, the MacCarthys defeated the Geraldines. The town was founded by Sir William Petty in the 17th century. Market day, Sat. Pop. of rural district, 9,007.

Kenmare river is really an opening of the sea between cos. Kerry and Cork. It is 28 m. long and from 2 to 6 m. wide. See Kerry.

Kenmare, EARL OF. Irish title borne since 1801 by the family of Browne. Sir Valentine Browne, made a baronet in 1622, owned the lakes of Killarney. His grandson, also Sir Valentine, suffered in estate for his loyalty to James II, as did the 4th baronet, Sir Nicholas, but the fifth recovered the family property. Sir Valentine, the 7th baronet, was made a baron and a viscount in 1798, and an earl in 1801. His son, the 2nd earl, was made a peer of the U.K. in 1841; this title did not pass to his brother, Thomas, who received a new barony in 1856. Valentine, the 4th earl, was lord chamberlain 1880-85. The 6th earl is noticed below, and the 7th was Gerald (born 1896), who succeeded his brother in 1943. An eldest son would be called Viscount Castlerosse. The earl's seat is Kenmare House, Killarney.

Kenmare, VALENTINE EDWARD CHARLES BROWNE, 6TH EARL OF (1891-1943). A British journalist, known as Viscount Castlerosse until he succeeded his father in the earldom in 1941. Born May 29, 1891, he was educated at Osborne, Downside, and Trinity, Cambridge. In 1924 he was invited by Lord Beaverbrook to write a gossip column in the Sunday Express; he called it A Londoner's Log and made an instantaneous success of it. Castlerosse published memoirs, Valentine's Days, in 1934. He died Sept. 20, 1943.

Kennebec. A river of Maine, U.S.A. Rising in Moosehead Lake, it flows S. 150 m. into the Atlantic, entering it through Sagadahoc co. and Sheepscott Bay. Its largest tributary is the Androscoggin. Its water-power facilities are probably unsurpassed; descending 1,000 ft. in its course, it has falls at Waterville and at three points above. Tidal influence is felt at Augusta, the

state capital, which stands at the head of navigation 45 m. from the sea. Here is the Kennebec Dam, first built in 1837. Wymnan Dam, which forms an artificial lake at Bingham, has a total capacity of 8,000,000,000 cu. ft. Draining the greater part of the state, the Kennebec has hundreds of lakes in its system and scores of harbours in the lower reaches.

Kennedy. Name of a famous Scottish family. Its original home was in Ayrshire, and its head is the marquess of Ailsa (*q.v.*). The family name is a variant of Kenneth. John Kennedy secured lands at Cassilis about 1350, and his descendant, Gilbert, was made Lord Kennedy in 1452. His brother James was the bishop of St. Andrews who founded S. Salvador's College there. David, 3rd Lord Kennedy, was made earl of Cassilis, 1502, and in 1831 Archibald, 12th earl, was made marquess of Ailsa.

Kennedy, BART (1861-1930). British author. Born at Leeds, of Irish parents, March 9, 1861, and brought up under hard conditions in Manchester as a machine-hand, he went to sea before the mast, and saw rough life in the American West, upon which he drew in some of his works. A Tramp in Spain is characteristic of his travel books, and The Voice in the Light contains excellent examples of his short stories. He founded Bart's Broadsheet (weekly), 1921. He died Dec. 6, 1930.

Kennedy, BENJAMIN HALL (1804-89). British scholar, born at Summer Hill, Birmingham, Nov. 6, 1804. He was educated at Shrewsbury and S. John's College, Cambridge; he became fellow and lecturer at S. John's in 1828, and was ordained. From 1830 he was a master at Harrow until in 1836 he was chosen headmaster of Shrewsbury. There Kennedy remained for 30 years, during which the school produced some of the greatest classical scholars of the time. In 1867 Kennedy became regius professor of Greek at Cambridge and canon residentiary of Ely. He died April 6, 1889. He edited classical authors, but is best known by his Public School Latin Grammar. He helped to revise the N.T. and to found Newnham and Girton Colleges. See Shrewsbury School.

Kennedy, CHARLES RANN (1808-67). A British scholar. Born at Summer Hill, Birmingham, he was a younger brother of B. H. Kennedy. Educated at Shrewsbury and Trinity College, Cam-



Kenmare, co. Kerry. The suspension bridge seen from the south west

bridge, in 1831 he was senior classic. He translated various classical authors, but his main work was as a barrister; he was also professor of law at Queen's College, Birmingham. An action he brought in 1856 was responsible for the decision that a barrister cannot sue for his fees. He died Dec. 17, 1867.

Kennedy, GEOFFREY ANKELL STUDDERT (1883-1929). An English clergyman. He was born at Quarry Hill,



Rev. G. A. Studdert Kennedy, English clergyman

Leeds, June 27, 1883, and was ordained in 1908, and later became chaplain to the king. Famous as an army chaplain during the First Great War, he earned the nickname of Woodbine Willie (after a pre-war character in a comic paper) from his gifts of cigarettes to the soldiers. His verse publications include *Rough Rhymes of A Padre*, 1918; *Food For The Fed-Up*, 1921; and his collected poems, *The Unutterable Beauty*, 1927. Died March 8, 1929.

Kennedy, JOSEPH PATRICK (b. 1888). American diplomatist. He was born in Boston, Sept. 6, 1888, and educated there and at Harvard, becoming a bank examiner for Massachusetts in 1912. He was president of the Columbia Trust, 1914-17, and held several other executive positions, including the chairmanship in 1934-35 of the securities and exchange commission. Having organized the U.S. maritime commission in 1937, he was next year appointed ambassador to Great Britain. He returned to the U.S.A. in Oct., 1940, and expressed his opinion in a broadcast that his country must stay out of the Second Great War, as the U.K. would ultimately become National Socialist. He resigned in Dec. His daughter Kathleen, married 1944 to the marquess of Hartington who was killed in action the same year, was herself killed in an air crash, 1948.

Kennedy, MARGARET. British novelist and dramatist. Educated at Cheltenham and Somerville College, Oxford, she published *A Century of Revolution*, 1922, and next a first novel, *The Ladies of Lyndon*. She made her name with *The Constant Nymph*, 1924, which proved outstandingly successful as novel, play, and film. Other stories included *Return I Dare*

Not, 1931; *The Midas Touch*, 1938; *The Feast*, 1950. She collaborated with Basil Dean in adapting *The Constant Nymph* for the stage; and wrote the plays *Escape Me Never*, and *Autumn*. She married David Davies, later a judge.

Kennel (Fr. *chenil*, late Lat. *canile*). A building or range of buildings in which dogs are kept. The term is applied to all such structures, from the wooden hutch of the watchdog to the elaborate buildings (kennels) in which a pack of hounds is housed. The name is also used loosely to include the staff and organization of any establishment where dogs are maintained.

Kennel Club. Society founded in 1873 by S. E. Shirley to promote the interests of dog breeders. All leading shows are held under its rules, and it has rendered good service in promoting the general welfare of dogs. Its h.q. is 84, Piccadilly, London, W.1. See *Dog*.

Kennet. River of Wiltshire and Berkshire, England. Rising on the Wiltshire Downs and flowing 44 m. in a generally E. direction to the Thames at Reading, it is noted for trout. It is navigable to Newbury.

Kennet, EDWARD HILTON YOUNG, 1ST BARON (b. 1879). A British politician. Born March 20, 1879, he was educated at Eton and Trinity College, Cambridge, and was called to the bar in 1904; but, abandoning the law, became assistant editor of *The Economist*, and then of *The Morning Post*, 1910-14. He served with distinction in the Navy in the First Great War, losing an arm at Zeebrugge, 1918. In 1915 he was elected Liberal M.P. for Norwich, for which he sat with one short interval until 1929. Then he joined the Conservatives, being their member for Sevenoaks until he was raised to the peerage in 1935. He was financial secretary to the treasury 1921-22; frequently a delegate to the League of Nations; and chairman of many royal commissions. In 1931 Young became minister of health in the National government, winning renown as a crusader against slums. His writings include financial studies and collections of verse; he was president of the Royal Statistical Society and the Poetry Society.

In 1922 he married Kathleen, widow of Capt. R. F. Scott, the polar explorer. Lady Kennet was a talented sculptor and portrait painter. Examples of her work are the memorials to Capt. Scott in Waterloo Place, London; Hon. C. S. Rolls at Dover; Lord Northcliffe in Fleet Street; Adam

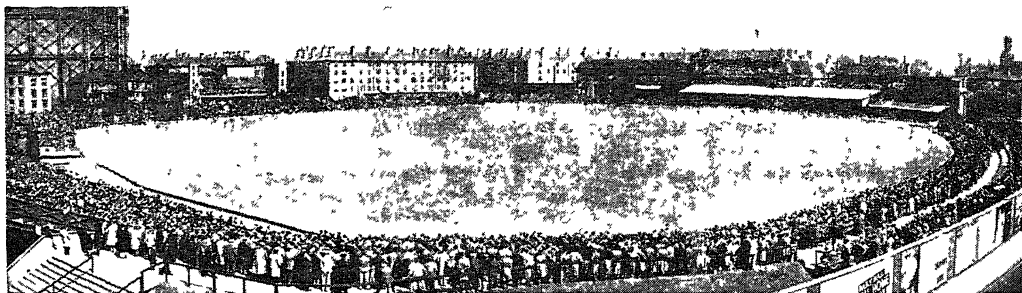
Lindsay Gordon in Westminster Abbey; war memorials at Huntingdon and at Oundle school; and busts of Oxford and Asquith (Tate Gallery) and Lloyd-George (Imperial War Museum). She died July 25, 1947.

Kennet and Avon Canal. A waterway of England. Passing through Berkshire, Wiltshire, and Somerset, it connects Reading with Bristol. Including the Kennet river and Avon river sections, it measures 86½ m., and has 106 locks. Constructed in 1810, it was in the hands of the G.W.R. 1852-1948.

Kenneth. Name of two kings of the Scots. The first, Kenneth McAlpin, was the son of Alpin, king of the Scots. He is said to have crushed the Picts and invaded Northumbria. He died in 860 or 862, and was buried at Iona. Kenneth II was the son of Malcolm I. He fought against the Northumbrians and was murdered by his own people 995. The name is Celtic and means comely.

Kennicott, BENJAMIN (1718-83). A British Biblical scholar. Born at Totnes, April 4, 1718, he was educated at Wadham College, Oxford. He rendered memorable service to textual criticism by collating, with other scholars, the Hebrew MSS. of the Bible. The work occupied nine years (1760-69) and resulted in the publication of the *Vetus Testamentum Hebraicum cum variis Lectionibus*, 2 vols., 1776-80. Kennicott's labours were supplemented by De Rossi's *Variae Lectiones*, the MSS. collated by the two totalling 1,346. In 1767 Kennicott was made Radcliffe librarian, and in 1770 canon of Christ Church. He died Sept. 18, 1783.

Kennington. District of the London bor. of Lambeth (*q.v.*). Styled in Domesday Chennintun, it was a royal manor in Saxon times, and is associated with Hardicanute. The manor was granted to the Black Prince by charter of 1337. Most of the original demesne, together with Prince's Meadows at Waterloo, remains the property of the duchy of Cornwall. In 1337 a manor house stood on the W. side of Kennington Road. In 1517 it was demolished by Henry VIII, the materials being used for building Whitehall. Kennington Park (31 acres), opened in 1852, covers part of the former common, scene of the execution of many who took part in the Jacobite rising of 1745. The common was also the scene of Feargus O'Connor's abortive



Kennington Oval. The cricket ground of the Surrey County Cricket Club, scene of many memorable Test and county matches

Chartist demonstration, 1848 (see Chartism).

Kennington's industries have included brickworks, plate glass factories, glass blowing works, clay pipe factories, pottery, brewing, distilling, and pickling. Wheelwrights were numerous until the advent of the motor car.

The chief church is S. Mark's, built 1824, one of four churches in Lambeth set up by the authority of parliament as a thanksgiving for the victory of Waterloo. It was made unusable by enemy air action during the Second Great War. At the vicarage Viscount Montgomery was born. Kennington Oval, ground of the Surrey Cricket Club, was opened in 1845. Vauxhall Gardens, originally Spring Gardens, mentioned by Pepys in his Diary, 1661, and depicted by Hogarth, existed until 1859. As a div. of the borough of Lambeth, Kennington until 1945 returned one M.P. There are two stations on the Northern Line. Pop. 69,738.

Kennington, ERIC HENRI (b. 1888). A British painter and sculptor. Born in London, March 12, 1888, he was educated at S. Paul's and studied art at Lambeth. As official war artist during both Great Wars, his paintings attracted much attention, e.g. the Kensingtons at Laventie (painted on glass); while his portrait-heads, in chalk and pastel, of individual soldiers, both famous and humble, were notable no less for their strong power of draughtsmanship than for their study of human character. His sculpture included memorials to the 24th division (Battersea Park), and to Thomas Hardy, at Dorchester; colossal figures carved outside Cohen's



Eric Kennington,
British artist
Self-portrait

Library, Liverpool; and a bronze head in S. Paul's cathedral of T. E. Lawrence, whose Seven Pillars of Wisdom he illustrated. He executed brick carvings on the façade of the Shakespeare memorial theatre, Stratford-on-Avon.

Kenora. A town of Ontario, Canada, formerly known as Rat Portage. It is sited where the Winnipeg river issues from Lake of the Woods, 126 m. E. of Winnipeg, and has a station on the C.P.R. The chief buildings are Anglican and R.C. churches, a court house, and a hospital. The capital of the Rainy River district, it has flour and other manufactures and a trade in lumber. It is also a distributing centre for a mining district. Pop. 7,672.

Kenosha. A city of Wisconsin, U.S.A., the co. seat of Kenosha co. On Lake Michigan, it is 34 m. S. of Milwaukee, and is served by the Chicago and North Western rly. and lake steamers. There is a good harbour, and the manufactures include motor cars, brass and copper products, beds, and steel furniture. Kenosha has a civic centre and an historical and art museum. Settled in 1835 by emigrants from New York, it was incorporated in 1850. The first free public school in Wisconsin was established here. Pop. 48,765.

Kenōsis (Gr. emptying). Theological term for the deprivation of divine attributes or powers involved in the incarnation of Jesus Christ. It is used to sum up Phil. 2, v. 7, given in the A.V. as "made himself of no reputation, and took upon him the form of a servant, and was made in the likeness of men"; in the R.V. as "emptied

himself, taking the form of a servant, being made in the likeness of men," the five opening words of the A.V. and the two corresponding words of the R.V. being renderings of the Greek word *ekenōse*. The theory implies that Christ, in the act of incarnation, laid aside both His divine attributes and His self-consciousness, regaining both gradually and completely at His ascension; and that His knowledge of human affairs was limited to that of a man. See Incarnation; Pleroma; consult The Kenotic Theory, F. J. Hall, 1898; Bampton Lectures, C. Gore, 1922 ed.

Kensal Green. Dist. of N.W. London, on suburban elec. and Bakerloo rlys. A part of Willesden, it lies between Kilburn and Harlesden, and is notable for its two adjoining cemeteries, All Souls and S. Mary's (R.C.). In the former, opened 1833, are the graves of the duke of Sussex, his sister the Princess Sophia, the duke of Cambridge (d. 1904); and such 19th century celebrities as the two Brunels, Wilkie Collins, Thomas Hood, Leigh Hunt, Charles Kemble, John Leech, Robert Owen, Sydney Smith, Thackeray, Toole, and Trollope.

Kensington. One of the 28 met. bors. of London. Known as the royal borough, it covers



Kensal Green. Main avenue of All Souls Cemetery leading to the chapel

3½ sq. m. and includes the districts of Brompton, Campden Hill, Earl's Court, Holland Park, Notting Hill Gate, and Queen's Gate. It is bounded N.E. by Paddington, S.E. by Chelsea and Westminster, S.W. by Fulham, N.W. by Ham-



Kensington arms

mersmith. Within its borders is that part of Kensington Gardens containing Kensington Palace. A borough since 1899, Kensington is reputed to derive its name from a Saxon family of Kemings or Kensing. When Domesday was compiled the manor belonged to the bishop of Coutances; it passed to Aubrey de Vere, who gave part to the abbot of Abingdon.

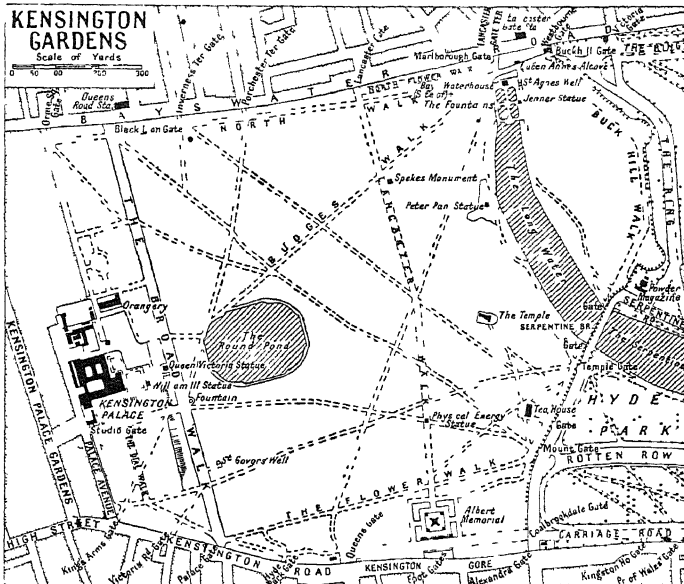
The parish church of S. Mary Abbots, built on a site where a church has existed since the 12th century, was designed by Sir Gilbert Scott. An example of the revived Gothic, it is notable for its spire (278 ft.) and vaulted cloister. It was opened 1872, tower and spire being added later. Roof and nave were badly damaged by fire in air raids of the Second Great War.

South Kensington, centre of museums and institutions of learning, contains the Victoria and Albert Museum; Imperial Institute, with its museum galleries (within Westminster); the British Museum of Natural History; Science Museum; Royal College of Art; the Imperial College of Science and Technology; Royal College of Music; Royal College of Organists; the house of the Royal Geographical Society. In Kensington Gore stands the Albert Hall (*q.v.*). Other buildings include Brompton Oratory, Brompton Hospital, and Olympia (*q.v.*).

The High Street is a favourite shopping centre, with well-known stores. Within the borough are fine examples of 18th and early 19th



Kensington, London. Part of the High Street, looking west, and showing (left) two of the great stores



Kensington Gardens. Plan of the London pleasure adjoining Hyde Park

Based upon the Ordnance Survey map with the sanction of the Controller of H.M. Stationery Office

of German bombs during the Second Great War, S. Paul's church, the church of Our Lady of Victories, and the Carmelite church were destroyed; the roof of S. Mary Abbots was burnt; and the interior of Holland House (*q.v.*) was destroyed by fire. Pop., pre-war, 180,677. Consult *The Old Court Suburb*, Leigh Hunt, new ed. 1902; *Passionate Kensington*, R. Ferguson, 1939.

Kensington Gardens. London pleasure ground between Hyde Park and Kensington Palace, bounded N. by Bayswater Rd., and S. by Kensington Rd. and Kensington Gore. The nucleus (26 acres) was bought by William III from Lord Chancellor Finch. Queen Anne added 30 acres, and Queen Caroline 200 acres. The gardens were laid out from designs by Bridgman, Kent, and "Capability" Brown

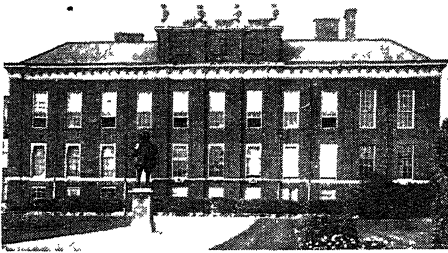
More formal, yet more wooded, than Hyde Park, the gardens are famous for avenues of plane trees and floral walks. At the S. side is the Albert Memorial (*q.v.*). There are statues of Queen Victoria (by Princess Louise), Dr. Jenner, William III (presented by William II of Germany); the bronze figure by Watts representing Physical Energy, a replica of the original on Table Mountain in memory of Rhodes; an obelisk in memory of Speke, African explorer; and Framp-ton's statue of Peter Pan (*q.v.*), presented by Barrie. Near the latter a site was proposed in 1947 for a playground in memory of children of all lands who lost their lives in the Second Great War. The Round Pond, which is actually octagonal, is a rendezvous for model yacht enthusiasts, adult and juvenile. The Long Water (part of the Serpentine), the Sunk Garden, and the Broad Walk are other features.

The gardens were famous at the end of the 19th century as the playground of well-to-do children escorted by nursemaids. In 1920 and 1926 at times of industrial unrest, the gardens were closed and used as a military camp; they were also used by troops at the coronation of King George VI and during the Second Great War.

Kensington Palace. Former royal residence. It is an enlargement of the original Nottingham

As a result

House, built in the reign of Charles II, and purchased from the 2nd earl of Nottingham by William III in 1689. Wren was commissioned to undertake the necessary rebuilding, and to him, with Gibbons as decorative collaborator, is ascribed the three-storeyed building on the W. side of the S. front, and the Orangery on the N.



Kensington Palace. South front of the palace, with statue of William III by H. Baucke

Wren was supplanted, after the accession of George I, by William Kent, whose baroque additions and ornamentation contrast unfavourably with the dignified work of his predecessor. The king's gallery and the grand staircase in the Wren wing are the noblest portions of the interior.

The parents of Queen Victoria were given apartments in the palace, where the future queen was born and spent her childhood. Her youngest daughter, Princess Beatrice, lived here many years. Queen Mary was born here in 1867. In 1948 it became the temporary home of the London Museum (*q.v.*).

Kensingtons, *THE*. Name popularly given to the 13th (County of London, Princess Louise's Kensington) battalion of the London Regiment (*q.v.*).

Kensit, JOHN ALFRED (b. 1881). A British anti-ritualist. Educated at Christ's Hospital, he founded the Protestant Truth Society, and organized the formation of agents known as Wickliffe preachers who travelled about the country in motor caravans. Kensit protested against the use of ritual within the Church of England. His father, an ardent anti-ritualist, was assassinated after a public meeting at Birkenhead in 1902; his son, a business man in London, lectured on Protestant defence; and their followers were known to raise cries of "No Popery" in City churches.

Kent. Anglo-Saxon kingdom. Its history begins with the invasion of Hengist and Horsa in 455, and Hengist is sometimes referred to as its first king. There is reason to

believe, however, that it was settled by the Jutes. Certainly in the 6th century it was one of the independent kingdoms into which Anglo-Saxon England was divided, at one time the most important. About 560 Ethelbert became its king—it was he whom Augustine baptized a Christian in 597—and for over a century his descendants ruled Kent. About 700 its independence and unity became impaired and there were at one time two kingdoms, but their kings were almost certainly the vassals of other Anglo-Saxon rulers. When Egbert ruled Wessex, the separate kingdoms came to an end. In some respects the customs of Kent differed from those of

the rest of England. Its capital was Canterbury, and when there were two kingdoms the other was Rochester. Its area was almost the same as that of the present county. See Britain.

Kent. County of England. In the S.E., it lies between the estuary of the Thames and Sussex, with the sea on its E. and S.E. Its area is 1,525 sq. m. Kent is largely a level area, but the North Downs run through it from Surrey, rising to 800 ft. and some of the best Kentish views are within 20 m. of London. In the centre is the Weald, and in the S.E., around Romney, is a low, marshy area. The islands, in name only, of Sheppey and Thanet, are also low-lying districts. The chief rivers are the Medway, Darent, and Stour. Maidstone is the county town. The W. end of the county is within the London area, where Beckenham and Bromley are practically suburbs of London. Around Chatham and Rochester is a great industrial area, while Gravesend with its paper mills is another busy place. Paper also has been made at several small centres on the rivers. {

Kent is a great hop growing county, the hop fields being mainly in the centre. It is also noted for fruit, considerable areas being devoted to plums, pears, and strawberries. With a fertile soil, there are many dairy farms, and wheat is grown. Cattle are reared, and the county is noted for sheep, especially those raised on the marshes.

All around the coast are watering-places, Herne Bay, Margate, Broadstairs, Ramsgate, Dover, and Folkestone. Tunbridge Wells is an inland watering-place. There is much fishing, and Kent has the chief ports for communication between England and central and southern Europe. Whitstable is celebrated for oysters. There is a coalfield, the only one in S.E. England, bounded N. by a line from Sandwich to Canterbury, S. from Folkestone to Wye, and E. by the sea. At Aylsham and Elvington model villages have been created for the workers.

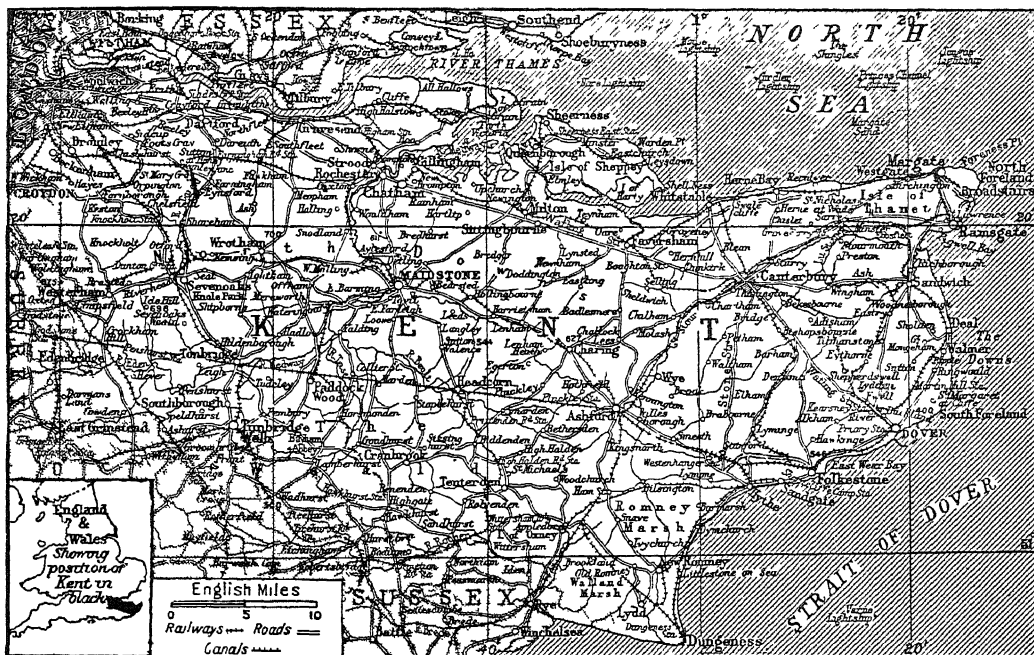
Kent is famous as a cricketing county, Canterbury and Tonbridge being the chief grounds. Its inhabitants retain a curious division. Those born on the right bank of the Medway are men of Kent, those born on the left are Kentish men. An old and unique division into six lathes still persists. The system of land tenure called gavelkind is peculiar to Kent.

Historically this is one of the richest parts of England. Here are Thanet, where Hengist and S. Augustine landed; Dover and the neighbourhood with its earlier associations with the Romans; Canterbury and Rochester with their cathedrals; Dover, Hythe, and other Cinque ports with their curious old customs; medieval castles, at Rochester, Hever, Leeds, and elsewhere; memorable houses such as Penshurst and Knole. As the first home of English Christianity, Kent has fine churches and there were many religious houses. Ruled by earls, it had in Norman times the privileges of a county palatine. In 1888 a small part was included in the new county of London. In the Second Great War its coast was shelled and its towns were damaged by air raids and flying bombs, while over Kent went on aerial combats in the battle of Britain. The county sends twelve members to the house of commons, exclusive of six for boroughs. Pop. 1,219,273.

LITERARY ASSOCIATIONS. "Kent in the Commentaries Caesar writ is termed the civil'st place of all the isle." Here Chaucer's pilgrims told their Canterbury Tales. The country about his native Penshurst is believed to have inspired some descriptions in Sidney's *Arcadia*, while that stately home or its surroundings were written of in poetry by Jonson, Waller, and Mrs. Browning. Most of the scenes of the anonymous Elizabethan tragedy, *Arden of Feversham*, were laid in or near Faversham. Shakespeare



Kent arms



Kent. Map of the south-eastern county of England, famous for its orchards and hop fields and its many associations with English history and literature

has many Kentish scenes, the most notable being that in which the cliff near Dover is described (King Lear, iv, 6).

Dickens described the county in David Copperfield, The Pickwick Papers, and Great Expectations. Thackeray has chapters about Westerham and Tunbridge Wells in The Virginians. Barham made Tappington the centre of The Ingoldsby Legends, setting some of the weird tales in Canterbury, Sheppey, and Thanet. Tennyson described a Mechanics' Institute meeting at Boxley in the Prologue to The Princess, and also placed some scenes of his Queen Mary in the same neighbourhood. At Downe Darwin found the material for his great study of The Earthworm. Wells has Kentish background in Tono Bungay and Kipps, and Jeffrey Farnol in The Broad Highway. V. Sackville West's The Edwardians describes Knole.

Bibliography. Notes on the Churches of Kent, A. Hussey, 1852; History of the Weald of Kent, R. Furley, 1871-74; Kentish Archaeology, W. A. S. Robertson, 1876-84; Highways and Byways in Kent, W. Jerrold, 1907; Victoria History, ed. H. A. Doubleday and W. Page, 1908; Kent, R. Church, 1947.

Kent, EARL AND DUKE OF. English titles borne by various princes and others. There was an earl of Kent very early, and this palatine county was ruled by Odo of

Bayeux in the time of William the Conqueror. As an hereditary title, the earldom began probably with Edmund, a son of Edward I. He was put to death as a traitor in 1330, but two of his sons were in turn earls of Kent.

In 1352 John, the younger of these brothers, died, and his daughter Joan succeeded to his estates. Known as the Fair Maid of Kent, she married first Sir Thomas de Holland, and then Edward, the Black Prince. Through her, Holland became the earl, and their son Thomas succeeded. The Hollands held the title until 1408. In 1461 William Neville was made earl, the title lapsing on his death in 1463.

In 1465 the title was revived for Edmund, Lord Grey of Ruthin, a descendant through his mother of the Hollands. Henry, 12th earl, a courtier under Anne, was made marquess of Kent in 1706 and duke in 1710. The titles became extinct when he died in 1740. In 1799 George III made his fourth son, Edward Augustus, duke of Kent, and the title died with him in 1820. It was revived in 1934 for the fourth son of George V, who is noticed separately.

Kent, EDWARD AUGUSTUS, DUKE OF (1767-1820). British prince and father of Queen Victoria. Born in London, Nov. 2, 1767, the fourth son of George III, he was educated in England and Germany and at

Geneva. He entered the British army, and in 1790 commanded the 7th Foot at Gibraltar, but, owing to his unpopularity, he was sent to Canada. In 1802 he became governor of Gibraltar. In 1799 the prince had been made



Kent and Strathearn
After Sir W. Beechey, R.A.

the duke of Kent and Strathearn. In 1818 he married Victoria Mary Louisa (1786-1861), widow of Emich Charles, prince of Leiningen. Their

child, Victoria, was born in 1819, and on Jan. 23, 1820, the duke died at Sidmouth.

Kent, GEORGE, DUKE OF (1902-42). British prince. Fourth son of King George V and Queen Mary, he was born Dec. 20, 1902, and christened George Edward Alexander Edmund. Entering the Royal Navy through Osborne and Dartmouth, he was midshipman in 1920. He served at sea until 1929, when his health compelled him to withdraw from active service. Then he spent periods in the Foreign and Home offices, and in 1931-32 toured industrial areas. He accompanied the prince of

Wales to Canada in 1927 and to S. America and Sweden in 1932; and himself toured S. Africa in 1934.

In that year Prince George was created duke of Kent, earl of St. Andrews, and Baron Downpatrick, became engaged to Princess Marina of Greece and Denmark (born Nov. 30, O.S., 1906); and married her on Nov. 29. Three children were born, Prince Edward (Oct. 9 1935), Princess Alexandra (Dec. 25, 1936), and Prince Michael (July 4, 1942). Appointed governor general of Australia, the duke was to have taken up his appointment in 1939, but was prevented by the outbreak of war. He paid a visit to Portugal in 1940, and in 1941 made a tour by air of Canada and visited the U.S.A., where he stayed with President F. D. Roosevelt.



Princess Marina
Duchess of Kent

He thus became the first member of the royal family to fly the Atlantic. When on Aug. 25, 1942, he set out on a flight to Iceland to inspect British forces, his aeroplane crashed in Scotland, and he was killed. Prince Edward George Nicholas Patrick succeeded at the age of six to the title.

Kent Bugle. Brass musical instrument of soprano pitch, with keys, sometimes called key bugle. It was invented or improved by James Halliday, a bandmaster, about 1810, and named after the



Kent Bugle or Key Bugle, invented
by James Halliday

duke of Kent. Popular for half a century, it is now superseded by the cornet-à-piston. See Bugle.

Kentigern (c. 518-603). Scottish saint and prelate. A member of the Pictish royal family, he was educated under S. Servanus, at the abbey of Culross, where he was known by the name of Mungo (well-beloved). When a young man he lived as a hermit at Glasgow (q.v.), and was consecrated bishop of the district. Political troubles compelling him to flee, he stayed with S. David at Menevia, Pembrokeshire, and founded the monastery of S. Asaph. He returned to Scotland about 560. He



George, Duke of Kent, 4th son of
George V and Queen Mary, killed in
an air crash, 1942

founded Glasgow cathedral, and is the patron saint of the city.

Kentish Fire. Organized applause, long popular at political meetings. It consisted in prolonged clapping of the hands in rhythm—a short sharp clap followed by a long sustained one, with an interval after every fourth clap. The expression was perhaps first used at one of the meetings held in Kent in opposition to the Roman Catholic Relief Act.

Kentish Rag. Term used for a limestone of the Hythe beds found in Kent. It is much used as a building stone and for road making. See Limestone.

Kentish Town. A district of N.W. London, in the borough of St. Pancras. Originally known as Kennistown or Cantlowes, it is considered to have been included in Domesday as a portion of land. Probably there existed then a prebendal manor belonging to S. Paul's, which about 1670 came into the possession of the Jeffreys family, from whom it passed to Earl Camden. The present parish church is the successor to Kentish Town chapel, the oldest church foundation in St. Pancras. Several scenes of Jonson's Tale of a Tub, 1633, are laid here. Even in the middle of the 19th century the district had pleasure grounds and tea gardens attached to taverns. Green Street saw maypole dancing in Tudor times. Samuel Palmer in his history mentions that in 1733 races were held in Kentish Town. Balloon ascents took place in 1785. Residents have included Judge Jeffreys, Nelson, Bessemer, Leigh Hunt, Keats, and Patmore.

Kent's Cavern OR KENT'S HOLE. Palaeolithic limestone cave near Torquay, Devon, containing remains of man, implements, and

associated animals. First examined by J. McEnery in 1825, it was systematically explored by W. Pengelly, 1865-80. Among the remains have been found bones of the mammoth, rhinoceros, wolf, lion, elk, reindeer, and grizzly bear, and implements of bone and stone. See Anthropology.

Kentucky. River of Kentucky, U.S.A. Formed by several streams rising in Cumberland Mts. on the S.E. border of the state, it flows 260 m. N.W. to the Ohio river between Louisville and Cincinnati. From Frankfort it is navigable for 60 m. High Bridge has a bridge 307 ft. above low water with three spans each 353 ft. long.

Kentucky. East-central state, of the U.S.A. Except in the E., which lies in the Allegheny region, and the S.E., broken by the Cumberland Mts., the surface is generally undulating. The N. and W. boundaries are formed respectively by the Ohio and Mississippi, the chief rivers of the state. Agriculture engages more than half the pop. of 2,845,627. The rich soil of the "blue grass" region in the centre yields large crops of wheat, maize, fruit, grasses, cotton, and tobacco. This is the leading hemp growing state. Livestock is important, sheep, cattle, and pigs being raised, while Kentucky has long been noted for its breed of horses. There are extensive forests of oak, maple, beech, walnut, ash, pine, and cedar.

Coal, petroleum, fluorspar, natural gas, and cement are obtained. Among the industries are flour and grist mills, tobacco manufactures, lumbering, the making of men's clothing and cotton goods. There are iron foundries, machine and rly. shops, slaughtering and meat-packing houses, and publishing and printing works. The railways have a track length of nearly 4,000 m. Mineral springs occur, and there are limestone caves, including the Mammoth and Colossal. At Covington is the smallest church in the world, seating only three worshippers. The house and estate where Stephen Foster wrote My Old Kentucky Home have been preserved as a state park.

Several universities and colleges provide higher education. Two senators and 11 representatives are returned to congress. The first white men to have discovered this territory were Marquette and Joliet in 1673, the first settlement being at Harrodsburg, 1774. A separate state from 1786, Kentucky was admitted to the Union on June 1, 1792. Louisville is far the

largest city and Frankfort the capital. *Consult History, T. D. Clark, 1937.*

Kentucky Coffee-tree (*Gymnocladus dioica*). Large tree of the family Leguminosae. It is a native



Kentucky Coffee-tree. Spray, flower, and seed-pod of the N. American tree

of N. America. It has large leaves divided into from 3 to 6 pairs of leaflets, and regular whitish flowers in sprays. The hard, flat pod is 7 or 8 ins. long, with several large seeds embedded in pulp. The early settlers in Kentucky used these seeds as a substitute for real coffee-beans. The tree yields a strong, fine-grained timber.

Kentucky Dam. Largest of 16 major dams constructed by the Tennessee Valley Authority (*q.v.*), U.S.A. It is built across the Tennessee river to form a reservoir of 256,000 acres impounding nearly 2,000 million gallons of water. Begun in 1939, the dam was opened in 1945, and is 1½ m. long and 206 ft. high; 4,000,000 cu. yds. of earth and 1,350,000 cu. yds. of concrete were used in its construction. The flow from the dam powers turbines driving four electric generating units, each with a capacity of 32,000 kW. The completion of the reservoir provided the last link in the navigation channel from the Ohio at Paducah, Ky. to Knoxville, Tenn., a distance of 650 m.

Kentucky Derby. A horse race for three-year-olds, one of the most important events on the American turf. It is run annually at Churchill Downs, Louisville. From 1875, when it was started, until 1896 the distance was 1½ m.; since then it has been 1¼ m. *Pron. durby.*

Kentville. The county town of King's county, Nova Scotia, Canada. Lying 72 m. N.W. of

Halifax, it is the headquarters of the Dominion Atlantic rly., and business centre of the Annapolis and Cornwallis valleys, the principal apple-growing regions of the province. There are four hotels, four churches, and a government experimental farm of 450 acres. All public utilities are municipally owned. Pop. 3,928.

Ken Wood OR CAEN WOOD. Public open space near London. On high ground between Highgate and Hampstead, it was formerly the estate of the earl of Mansfield. The house, which has N. and S. fronts, was constructed by Robert Adam, and enlarged by George Saunders. The surrounding wood is notable for cedars, beeches, and limes, and covers about 40 acres. Sheets of water are fed by springs that also supply Highgate Ponds.

In 1661 Thomas Venner and his Fifth Monarchy confederates fled here. The property belonged to a John Bill, who married a daughter



Ken Wood, Hampstead. The house, constructed by Robert Adam, which was left to the nation by Lord Iveagh, and opened to the public in 1923

of Sir Harry Vane. Acquired later by the dukes of Argyll, Caen Wood was devised to the 3rd earl of Bute. It was bought in 1755 by William Murray, 1st earl of Mansfield, and belonged later to Viscount Iveagh. The place was saved from the Gordon rioters in 1783 by the action of Giles Thomas, landlord of The Spaniards inn, who entertained them until military aid could be summoned. Adjacent is Bishop's Wood, also a part of the old forest of Middlesex. The actual wood was saved from the builder and opened to the public by George V in 1925. The house, valuable collection of pictures, and 73 acres, left by Lord Iveagh to the nation, were opened in 1928.

Kenworthy, COMMANDER. The M.P. for Central Hull, 1919-31, succeeded in 1934 to the barony of Strabolgi (*q.v.*).

Kenya. Isolated snow-capped mt. in Kenya Colony, E. Africa. About 80 m. N.N.E. of Nairobi, it is 17,040 ft. high, and has 15 glaciers. It was discovered by Krapf in 1847, and first scaled in 1899. The surrounding region is highly fertile. The middle of the massif, 350 sq. m., is alpine, the N. plateaux being suitable for whites. Outwards from this the slopes from 12,000 ft. down to 5,000 ft. are forested. Parts were scheduled as a national park in 1949.

Kenya Colony and Protectorate. A territory forming the E. portion of British East Africa, the rest being Uganda. It is bounded N. by Abyssinia, N.E. by former Italian Somaliland, S. by the former German colony of Tanganyika Territory, and S.E. by the Indian Ocean. Some other territories on the mainland which had belonged to the sultan of Zanzibar are also included, the whole forming a crown colony. Formerly a protectorate, Kenya was annexed to the crown, July 23, 1920, while the territories rented from Zanzibar were proclaimed a

protectorate. Area, 224,960 sq. m. There are five provinces: Coast (capital, Mombasa), Central (Nyeri), Rift Valley (Nakuru), Nyanza (Kisumu), and Northern (Isiolo). Part of Jubaland (*q.v.*) was ceded to Italy in 1925. Nairobi is the capital, and the colony is administered by a governor assisted by an executive council of ten and a legislative council of at most 39 members, the majority elected. A



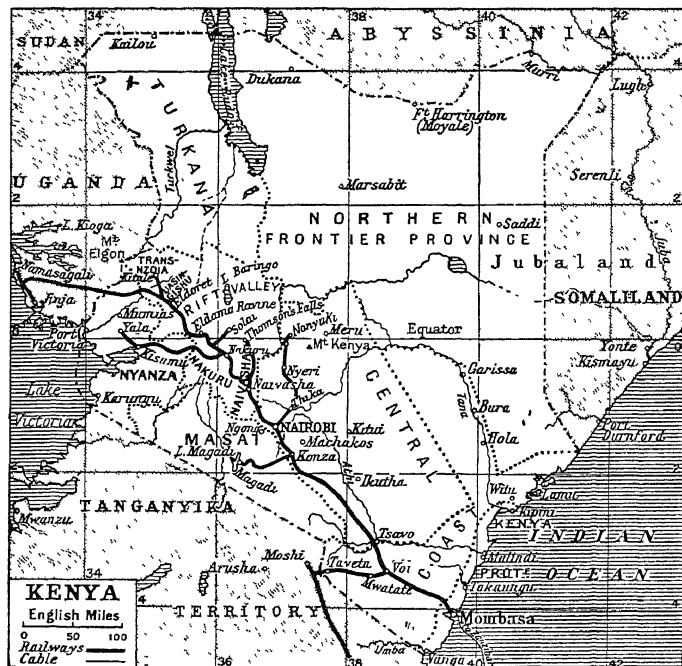
Kenya Colony. Coffee sacks on a plantation in this British East African territory

request for self-government was raised in 1946. The natives include Bantus, Somalis, Gallas, and other tribes, with Swahilis and Arabs near the coast. Pop. (1948) 5,184,000.

The surface is mainly elevated plateaux, 3,000 to 4,000 ft. in alt. with broad valleys and isolated peaks, Mt. Elgon, 14,140 ft. on the W. boundary, and Kenya, 17,040 ft., being among the highest. The principal rivers are the Tana, Umba, and Athi. Forests cover

titles. The existence is confirmed of graphite, mica, lead, iron, manganese, diatomite, and opals, but these have not been developed. Marble and limestone are quarried for domestic use.

Mombasa is the port, while Kilindini Harbour farther S. is landlocked and accessible to vessels of deep draught. Trade is mostly with the British Empire, which in 1945 took 85 p.c. of the exports and supplied 74 p.c. of the imports.



Kenya Colony and Protectorate. Map of this British territory in East Africa

over 3,000 sq. m., nearly all in the highlands, and yield many varieties of valuable timber. The lakes include Baringo, Naivashi, Magadi, part of Rudolf, and the N.E. portion of Victoria Nyanza. Agriculture is possible at altitudes from sea level, where the conditions are tropical, to over 9,000 ft.: the lowlands produce flax, coffee, maize, wheat, sisal, tea, and pyrethrum, while the uplands grow maize, sisal, sugar, coconuts, and cotton. Sheep, dairy, and ostrich farming thrive. As at least three million cattle and six million sheep are owned by the natives, hides, skins, and wool are important. The forests are mainly coniferous, with abundance of juniper and pencil cedar, but also contain hardwoods, e.g. camphor and olive.

Mineral resources are not yet fully explored. The main product is carbonate of soda, though gold and silver occur in small quan-

ties. The existence is confirmed of graphite, mica, lead, iron, manganese, diatomite, and opals, but these have not been developed. Marble and limestone are quarried for domestic use.

There were 45 government and nearly 3,000 other schools in operation in 1945. The supreme court of justice is at Nairobi, and sessions are held in the principal towns. District courts are presided over by magistrates, full consideration being given to native ideas and customs. The Kenya and Uganda rlys. are state-owned, with a gauge of one metre; there are nearly 1,500 m. of track. Telegraph and telephone systems are operated as one with those of Uganda and Tanganyika. A motor road leads from Nairobi across Uganda to Mongalla, Sudan.

Soon after Italy entered the Second Great War on the side of Germany her troops attacked Moyale on the Kenya-Abyssinian

border; and though the attacks were repulsed, the garrison withdrew on July 14, 1940. Bura was evacuated on Aug. 29, but was reoccupied by British troops on Jan. 9, 1941, the Italians having withdrawn. On May 22 Abyssinian irregulars, attached to the 1st South African div., entered Moyale unopposed, terminating the campaign in Kenya. South African troops used Bura and Garissa as advanced bases at the outset of their successful campaigns to conquer Italian Somaliland and S. Abyssinia. See East Africa Campaign; Mombasa; Nairobi.

Bibliography. The Vanishing Tribes of Kenya, G. St. J. O. Browne, 1925; Kenya from Chartered Company to Crown Colony, C. W. Hobley, 1929; British Policy in Kenya Colony, M. R. Dille, 1928; So This is Kenya, E. B. Hill, 1938; Kenya Chronicles, Lord Cranworth, 1939.

Kenyah. A primitive people of Indonesian stock in Sarawak and the north-central highlands of Borneo. Estimated at about 300,000, they are roundish-headed, wavy-haired, and cinnamon-hued.

Keokuk. City in the extreme S.E. of Iowa, U.S.A. The co. seat of Lee co., it stands on the junction of the Mississippi and Des Moines, 42 m. S.W. of Burlington by rly. It is noted as the site of a dam which extends nearly a mile across the Mississippi to Hamilton, Ill., to harness the Des Moines Rapids. The dam and hydro-electric power plant were constructed by a private company in 1913. Its turbines were four times the size of the largest previously built. The dam forms a lake of 100 sq. m., stocked with a variety of fish. Keokuk trades in fish, and manufactures maize and oat products, calcium carbide, plastics, shoes, steel castings, and ferro-alloys. Mark Twain worked in a printing establishment here. The first permanent white settlement was established here in 1820; it became a fur-trading post in 1829, and a city in 1847, named after a chief of the Sac and Fox Indians. Pop. 15,076.

Keonjhar. Former small state of India, now merged in Orissa. It lies to the N. of the Cuttack division. It is drained by the Baitarara river. Keonjhar is the chief town. The area is 3,096 sq. m., and pop. 529,786.

Keonthal. Former Indian state, now part of the Himachal union. Wheat and pulses are grown, but the cultivable area is not thoroughly tilled. Rainfall is 60 ins. Most of the people are Hindus. Including feudatories, the area is 295

sq. m., pop. 48,090; without feudatories the area is 186 sq. m., pop. 27,711.

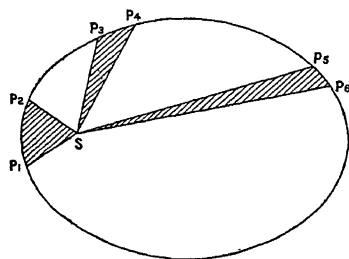
Kepler, JOHANN (1571-1630). German astronomer. Born at Weil in Württemberg, Dec. 27, 1571, he



early showed his remarkable capabilities, was admitted to the foundation of the university of Tübingen at 17, and in 1594 was appointed professor of mathematics and astronomy at Graz. In 1600 he went to Prague as assistant to the celebrated Tycho Brahe, whom he succeeded the following year. For 25 years he was astronomer and mathematician; to Upper Austria from 1612, when he moved to Linz; at Ulm, 1626-27, where he published the Rudolphine Tables; and to Wallenstein from 1628.

While on a journey to Ratisbon to press for the payment of moneys due to him from Wallenstein he caught a fever, and died Nov. 15, 1630. One of the most brilliant men of his age, he triumphed over illness, loss, and persecution. His fame rests upon the laws (*v.i.*) which bear his name, though he was also a pioneer of thought in many mathematical and astronomical theories. His greatest works were *Astronomia Nova*, 1609, and *Harmonices Mundi*, Libri V, 1619, containing the three laws of motion. Consult *The Martyrs of Science*, D. Brewster, 1874.

Kepler's Laws. Three laws of planetary motions enunciated by Johann Kepler. They are: (1) The orbit of each planet is an ellipse with the sun occupying one focus. (2) The speed of a planet is such that its radius vector $P_1 P_2 S$, describes equal areas $P_1 P_2 S$, $P_3 P_4 S$, etc., in equal times. (3) The squares of the periodic times of the planets are proportional to the cubes of



Kepler's Laws. Diagram explaining Kepler's second law. See text

their mean distances. The laws were deduced as unexplained facts from Brahe's observations; they were accounted for by Newton's law of gravitation. See *Planet*.

Keppel, AUGUSTUS KEPPEL, VISCOUNT (1725-86). British sailor. Second son of the 2nd earl of Albemarle, he was born April 25, 1725, and entered the navy. He accompanied Anson on his voyage round the world (1740-44), and was promoted commander on his return. In 1754 he was given command of the N. American squadron. After several small successes against the French he was sent as second in command on the Havana expedition. He was a member of the court-martial which condemned Byng.



Viscount Keppel, British sailor After Reynolds

In 1762 he was promoted rear-admiral, and in 1765-66 was one of the lords commissioners of the admiralty. Vice-admiral in 1770, and admiral in 1778, he was appointed commander-in-chief of the fleet which gave the French battle off Brest. The action was indecisive and Keppel, at the instigation of his subordinate, Palliser, was court-martialled for misconduct and neglect of duty, but was honourably acquitted. M.P. for Windsor in 1761, 1768, and 1774, and for Surrey in 1780, in 1782 he was made first lord of the admiralty and a viscount. Died Oct. 2, 1786.

Keppel, SIR HENRY (1809-1904). British sailor. Fourth son of the 4th earl of Albemarle, he was born at Kensington, June 14, 1809, and entered the navy in 1822. He had seen service in India, the Mediterranean, and the Cape, when in 1841, in command of the *China* and *Pacific* station, he stamped out piracy in those waters. He distinguished himself before Sevastopol, 1854-55, where he commanded the naval brigade, and in 1857 gained a victory over the Chinese at Fatsan Bay. During 1860-69 he held chief naval command at the Cape, Brazil, and China, being promoted admiral in 1869. Admiral of the fleet in 1877, he died Jan. 17,



Sir Henry Keppel, British sailor Downey

1904. Keppel wrote *A Sailor's Life under Four Sovereigns*, 1899.

Ker or KERR. The name of a famous Scottish family. John Ker of Selkirk obtained in 1357 a charter of lands, to which his descendant Andrew (died 1444) added lands in Roxburgh and Cessford. Two branches of Kers were founded by Andrew's grandsons. Sir Walter (d. c. 1583) of the Cessford branch was ancestor of the dukes of Roxburghe, while from his brother Mark (d. 1584) sprang the marquesses of Lothian. Members of the Ferniehirst branch became Lords Jedburgh and earls of Ancrum. These titles were combined with that of Lothian by Robert, 1st marquess (1636-1703).

Ker, JOHN (1673-1726). Scottish spy. Born in Ayrshire, Aug. 8, 1673, his real name was Crawford, but he called himself Ker of Kersland on his marriage with a daughter of that family and his acquisition of the estates. He became a Covenanter, but got in touch with the government and began to spy on his associates. Then came a connexion with the Jacobites, whom he similarly betrayed. Information about his doings is necessarily vague, but he was active in the Jacobite rising of 1715. He died in prison for debt, July 8, 1726. He left *Memoirs*, for publishing which in 1726 Edmund Curll was pilloried.



John Ker, Scottish spy

Ker, WILLIAM PATON (1855-1923). A British scholar. Son of a Glasgow merchant, he was educated at Glasgow university and Balliol College, Oxford. He was Taylorian scholar in 1878. Professor of English literature and history in University College, Cardiff, 1883-89; of English literature, University College, London, 1889-1922; and of poetry at Oxford from 1920, he wrote *Epic and Romance*, 1897; *The Dark Ages*, 1904; *Essays on Medieval Literature*, 1905. He died July 17, 1923.

Kerala. Ancient kingdom of S. India. It included the W. coast of Madras, but its boundaries are uncertain. About the end of the 9th century it was invaded by the Cholas, a neighbouring people. In 1310 the country was overrun by the Mahomedans, who in their turn were defeated by the Hindus under the chiefs of Vijayanagar. Kerala was then absorbed in the

Vijayanagar kingdom, which was overthrown by the Mahomedans at the battle of Talikota in 1565.

Keratin (Gr. *keras*, horn). Chief constituent of horn, hoofs, hair, nails, and feathers. Consisting mainly of scleroproteins, it is insoluble in the usual protein solvents. Keratin, dissolved in ammonia, is employed for coating pills the medicinal effects of which it is desirable to delay. *See* Horn.

Keratitis. Inflammation of the cornea. It may be due to injury or infection by the micro-organisms of tuberculosis, syphilis, and other diseases. *See* Cornea; Eye.

Keratophyre. In petrology, a variety of volcanic rock allied to trachyte. It consists of alkali feldspar, with a varying but small proportion of chlorite and iron oxides. The keratophyres are chiefly lavas. *See* Trachyte.

Kerb. An alternative spelling of curb (*q.v.*), usually applied to a stone at the edge of a footpath. In New York the kerb market is an offshoot of the Stock Exchange, a kind of street market.

Kerbela or **KARBALA**. Town of Iraq, one of the holy cities of the Shi'ite Mahomedans. Containing the tomb of Hussein, the grandson of Mahomet, it lies about 60 m. S.S.W. of Bagdad, is connected by a canal with the Euphrates, and is close to the ruins of Babylon. It has a considerable trade in dates and grain, but it derives most of its prosperity from the pilgrims. Bodies of the pious are brought here from all quarters for burial. The large mosque dedicated to Hussein has its dome covered with plates of gold. Kerbela gives its name to a liwa, pop. 140,356.

Kerch. Russian town, in the E. of the Crimean peninsula. It is on the strait of the same name, which connects the Black Sea with the Sea of Azov. Trade is normally done in wheat and furs, and factories make soap, leather, and tobacco. Deposits of iron ore occur near, and also a wealth of ancient Greek remains. Pop. 104,471.

The site of an ancient Milesian colony, Panticapaeum, afterwards capital of the kingdom of Bosphorus, Kerch has been held by Genoese and Turks. It passed to Russia in 1773. During the German drive for the Crimea and the Caucasus in 1941, Russian forces were compelled to evacuate the inner defences on Nov. 16, after destroying all industrial plants and the quays. On Dec. 30 they recrossed the strait and retook Kerch and Feodosia. In May, 1942, a German offensive forced the Russians to

evacuate Kerch again. It was finally cleared of the Germans by the Russian maritime army on April 10, 1944. *See* Russo-German Campaigns.

Kerchief (old Fr. *couvre-chef*, head-cover). Square of linen used by women during the 11th-14th centuries as a covering for the head and the neck. Another name was head-rail. From it has come the word handkerchief (*q.v.*).

Keren or **CHEREN**. Town and plateau of Eritrea, E. Africa. It forms a natural fortress guarding Asmara, about 20 m. S.E., and the rly. from Sudan to the coast. After their defeat at Agordat in 1941, Italian troops withdrew to Keren. British and Indian troops began to move against it on Feb. 6. After a month's preparation three columns assaulted the plateau on March 15, several peaks overlooking Keren being stormed that day; but there was further heavy fighting before the Italians surrendered on March 27.

Kerensky, **ALEXANDER FEODOREVITCH** (b. 1881). A Russian politician. Born at Simbirsk, he studied law at the capital and became a barrister at Moscow, gaining a reputation for his defence of political prisoners. A moderate Socialist in the last duma, he became minister of justice under Prince Lvoff, March, 1917. In May he was minister of war and marine.



A. F. Kerensky,
Russian politician

Kerensky's oratorical powers making him the chief figure in Russia, he toured the disorganized front to prepare an offensive in July, and became prime minister and minister of war in a coalition. On Sept. 15 Kerensky proclaimed a republic, with himself as president and c.-in-c. His position was assailed from both sides, by the military reactionaries under Korniloff, and by the Bolshevik extremists. With the covert encouragement of British representatives, Korniloff staged a military coup; this failed and its leader was arrested, but the last chance of achieving unity between army and government had vanished.

Unsupported by the allies, Kerensky fell before the combined onslaught of Lenin and Trotsky, Oct. 25. On Nov. 7 his headquarters was shelled, and he fled to England, where in 1919 he published *Prelude to Bolshevism*.

He settled in Paris, but moved in 1940 to Queensland, thence to the U.S.A. Kerensky's accusation, in *The Crucifixion of Liberty*, 1934, that he received no help from his allies in 1917, is hard to refute. But it may be doubted whether he could have succeeded in a situation calling for a man of immense authority. His story of the revolution is also told in *The Catastrophe*, 1927.

Kerguelen Land or **DESOLATION ISLAND**. Uninhabited island in the S. section of the Indian Ocean (50° S., 70° E.). It was discovered by Kerguelen Trémarec in 1772, and annexed by France in 1893, ranking since 1924 as a dependency of Madagascar. Glaciated, with deeply indented shores, it is mountainous (Mt. Ross, 6,200 ft., snow-capped), and its area is about 1,400 sq. m. The Kerguelen cabbage is a unique plant valued by mariners as a vegetable.

Keriya. Town in the S.W. of Sinkiang prov., China. It lies 100 m. E. of Khotan, on the southern route from China to W. Asia. At an alt. of 4,600 ft. on the river of the same name, Keriya comprises an old town of about 1,000 mud and stone houses and a new town of 2,000 houses.

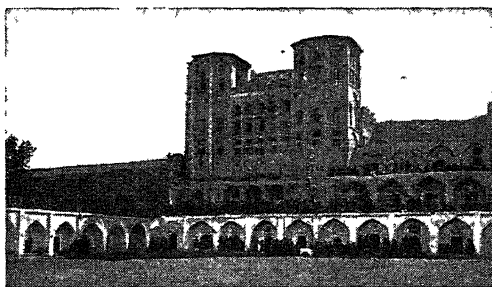
Kerkyra. The Greek name for Corfu. *See* Corcyra; Corfu.

Kermadec. A group of uninhabited volcanic islands in the Pacific. They lie 600 m. N. by E. of New Zealand, to which they have belonged since 1887. They comprise Raoul or Sunday, Macaulay, L'Espérance or French Rock, and Curtis Islands, and have a total area of 13 sq. m.

Kerman or **KIRMAN**. City of S. Persia. It is the capital of the prov. of the same name, and is about 400 m. S.E. of Teheran, and more than 200 m. almost due N. of Bandar Abbas, with which it is connected by a fairly good road. Five great roads radiate from the town which stands on an elevated plain (5,500 ft.). It is a considerable trade centre, manufactures carpets, silks, and camel-hair cloth, and exports dates. The camels and goats of the district are famous for their long hair. Kerman province, which adjoins Afghanistan and Baluchistan, is the largest in Persia, and all of it, except the desert of Kerman on the N. and N.E., is fertile. During the First Great War the city was policed by a mixed force under Sir Percy Sykes. Pop. 50,000.

Kermanshah or **KIRMANSHAH**. City of N.W. Persia, and capital of the small prov. of the same

name. It is about 270 m. S.W. of Teheran, and is a great caravan centre, trading in carpets, silks, yarns, hides, horses, and opium. Pop. 89,000. During the First Great War it changed hands several times, being finally occupied by the British early in 1918. In



Kermanshah, Persia. The governor's palace in the great square

fighting between the Allies and Persia in 1941, British and Indian troops entered Kermanshah against negligible resistance on Aug. 30. In 1946 Abbas Khan Gubadian, a political prisoner released at the time of the shah's abdication in 1941, led a rising among the Kalhor tribes in the S. of Kermanshah prov. They demanded local autonomy, and timed their revolt to coincide with the similar movement in Fars prov. on the Persian Gulf. Peace was restored in a few weeks.

Kermes. Dye obtained from the dried bodies of female kermes insects. It is one of the oldest known dyes, but has been displaced in modern times by cochineal, though still widely used in India and Persia. The kermes insect feeds on the kermes oak, *Quercus coccifera*, a bushy shrub with evergreen leaves. The size of a pea, the kermes insects are extremely abundant in certain districts, and are killed with the fumes of boiling vinegar, afterwards being dried in

used in France and Italy as Carthusian powder. Kermes comes from the Arabic word for crimson.

Kermess. Term for a local outdoor festival and fair popular in Belgium and Holland; derived from *kerk mes* (church mass). It was originally held annually on the feast day of the local patron saint or of the chief church. In the U.S.A., the word connotes an indoor entertainment and fair.

Kern, JEROME DAVID (1885-1945). American song writer. He was born in New York, Jan. 27, 1885, and died there Nov. 11, 1945. Attracted to syncopation, he made his name in 1914 with the song *They Didn't Believe Me*. Musical comedies with his scores included *Sunny*, 1925; *Show Boat*, 1927; *Music in the Air*, 1933; then he composed for Astaire films, e.g. *Roberta*; *Swing Time*. Lasting favourites among his melodies include *Ol' Man River*; *Can't Help Loving That Man*; *Smoke Gets In Your Eyes*; *The Way You Look Tonight*; *All The Things*

a publishing house he developed his gifts in two different spheres, the religio-imaginative and the popular novel. Widely read were his booklets *God and the Ant*, 1895; *The Child, the Wise Man, and the Devil*, 1896; and *The Man of No Sorrows*, 1911. His novels include *Captain Shannon*, 1897, and *Scoundrels & Co.*, 1901. His best critical work is preserved in *Wise Men and a Fool*, 1901. Some of his literary friendships are commemorated by *In Good Company*, 1917. Later works were *Celebrities*, 1923; *A Dog and His Master*, 1932. He died Feb. 17, 1943.

Kernstown. Place in Virginia, U.S.A., about 4 m. from Winchester, scene of an engagement during the American Civil War. On March 23, 1862, the Federals under James Shields were falling back, followed by a Confederate force under Jackson. The latter, although about 3,500 to 7,000, attacked, but were beaten with heavy losses.

Kerogen. Name given to the organic matter in oil shales and in related rocks. It is practically insoluble in organic solvents, but when heated strongly a large proportion is converted to oil. The chemical constitution of kerogen is complex and unknown; it appears to be formed of plant remains. See *Oil Shale*.

Kerosine. The proper name for lamp oil or paraffin oil. A petroleum distillate intermediate between gasoline and gas oil, its boiling range depends on the purpose for which it is required and on the specifications of the gasoline and gas oil being produced in the same operation; usually it falls between 150° C. and 300° C. Kerosine is used in lamps and stoves with wick and with vapouriser burners for illumination and heating; as fuel in internal combustion engines; and in smaller quantities as a solvent, for cleaning, and for thinning asphaltic bitumen so that it can be spread on roads with the minimum amount of heating. To be suitable for wick-fed lamps, crude kerosine requires chemical refining to remove substances which cause smoky flames, charred wicks, and deposition of tarry substances. For spark-ignition internal combustion engines, it must be free from impurities, and the distillation range must be such that the whole oil readily vaporises.

Kéroualle OR **QUÉROUAILLE**, LOUISE DE (1649-1734). Mistress of Charles II of England, who created her duchess of Portsmouth (q.v.).



Kerman, South Persia. One of the six city gates. See text in facing page

the sun. The colouring matter, kermesic acid, has the formula $C_{12}H_{12}O_9$, and dyes a dark red.

Kermes mineral is the name applied to sulphurated antimony, an orange-red powder first prepared by Glauber in 1651. It was once famous as a medicine, being much

You Are; *Long Ago and Far Away*. Kern was a notable book collector.

Kernahan, COULSON (1858-1943). A British author. Born at Ilfracombe, Aug. 1, 1858, his first success was *A Dead Man's Diary*, 1890. While literary adviser to

Kerr, MARK EDWARD FREDERIC (1864-1944). British sailor. Born Sept. 26, 1864, he was the son of



Admiral Mark Kerr,
British sailor

an admiral and grandson of the 6th marquess of Lothian. He entered the navy in 1877, was commander of the Implacable in 1901, and in 1903 was appointed naval attaché in Rome. Rear-Admiral in 1913, he headed a naval mission to Greece, and in 1916-17 commanded the Adriatic squadron. On formation of the R.A.F., 1918, he became deputy chief of air staff. He retired in 1922 with the rank of admiral. Author of essays and poems on naval subjects, he died Jan. 20, 1944.

Kerria (*Kerria japonica*). An evergreen shrub of the family Rosaceae. A native of Japan, it has long slender branches, sharply toothed oval leaves, and an abundance of buff-yellow flowers during most of the year. The form commonly grown in gardens has double flowers, and is of less graceful appearance than the natural plant.

Kerry. A maritime co. of Eire, in the prov. of Munster. Bounded N. by the Shannon estuary, E. by Cork and Limerick, and S. and W. by the Atlantic, with an area of 1,815 m., it has a much indented coast deeply penetrated by the long inlets called the Kenmare river, Dingle Bay, Brandon Bay, and Tralee Bay, and is fringed with islands, Valencia, the Blaskets, Skelligs, etc. There are plains of brown bog, pasture, and plough land, but the surface is generally rugged and mountainous, limestone, millstone grit, and Old Red Sandstone predominating. Macgillicuddy's Reeks (Carrantuohill, 3,414 ft.; Beenkeragh, 3,314 ft.) is the loftiest range in Ireland. Other summits are Brandon, 3,127 ft., in the W.; Mangerton, 2,756 ft., near Killarney; and Baurtregaum, 2,796 ft., and Caherconree, 2,715 ft., in the Slieve Mish range.

The loughs include those of Killarney (q.v.); Caragh to the W.; Guitane, to the S.E.; Currane, at Waterville; Inchiquin. Rivers are picturesque and support a salmon fishery. Red deer still exist near Killarney. The golden eagle is a rare visitor, as is the peregrine falcon, but merlin, kestrel, woodcock, grey crow, rook, magpie, and sea birds abound. London

pride and fuchsia grow in profusion. Pasture and fishing provide the chief industries. There are weaving mills; and lace making, knitting, and embroidery are fostered in convents, schools, and cottages. Copper mining and slate-quarrying were once extensive. Tralee, the county town, Killarney, Kenmare, and Listowel are served by Eire State rlys. A celebrated drive is the Kerry Ring, via Cahirciveen (birthplace of O'Connell) and Parknasilla.

The early history of "the kingdom of Kerry and the county of S. Brandon" is associated with Milesian emigration from Spain. It was held in the 12th century by O'Sullivans, O'Donoghues, O'Connors, MacCarthys, and other clans. An ancestor of the earls of Kerry was Raymond le Gros, a follower of Henry II of England; with him came the FitzGerald, from whom are descended the houses of Kildare, Lansdowne, Desmond, Knight of Kerry, and Knight of Glin. Famed in legend, the co. is rich in antiquities: Ogham stones, stone forts or cahers, beehive cells, stone-roofed oratories, chapels, the round tower at Rattoo, castles, abbeys, and cromlechs.

Gaelic was spoken before the official 20th century revival. Kerry was once notable for hedge schools and for the classical knowledge possessed by its peasantry. Under state care are 22 localities possessing historical monuments. The county was the scene of disturbances in 1921, when a good deal of damage was done. Seven members are sent to the Dáil. Pop. 136,072.

LITERARY ASSOCIATIONS. First come the Annals of Innisfallen, written 1215-1320. Spenser, an official of the British crown, wrote in Kerry part of The Faerie Queene. Moore sang of Sweet Innisfallen. Tennyson wrote part of The Princess in Ross Castle, Killarney. Froude lived at Derreen and wrote his romance The Two Chiefs of Dunboy. *Consult* Kerry, C. P. Crane, 2nd ed. 1914.

Kerry. Breed of native cattle found in S.W. Eire. The direct descendants of the old Celtic short-horn, they are now small, averaging in weight about 900 lb. They are black in colour, but the cows often have a splash of white

on the udder, while the skin is orange-coloured. Keries are very hardy and flourish on poor pasture. They are chiefly valued as notable yielders of milk, but are also esteemed for breeding purposes, as crosses with shorthorns produce useful animals. The Jersey-Kerry is a profitable dairy cow. *See* Cattle colour plate.

Kerry Blue Terrier. Medium-sized, shaggy-haired breed of dog, known in Eire as the Irish Blue terrier. Its origin is obscure; one theory is that it resulted from crossing a Bedlington with a red Irish terrier. Kerry Blues are plucky and sagacious and for many generations have worked arduously on farms. The coat is soft to the touch, wavy, and weather-resisting, and may be any shade of blue, sometimes with slight tan markings. First classified by Cruft's in 1922, show specimens have notably straight forelegs and



Kerry Blue Terrier. A breed of shaggy-haired dogs of a blue colour

are heavily whiskered. Puppies are born black and become blue later.

Kerulen. River of Outer Mongolia. Rising E. of Urga, it flows E.N.E. through the Gobi desert to join the Argun not long after it has crossed the W. frontier of Manchuria, after a course of 600 m. The Dalai Nor is formed by this river.

Keshub Chandra Sen (1838-84). An Indian religious reformer. Born and educated at Calcutta, where he was at first a bank clerk, soon after 1857 he became leader of the Brahma Samaj, a movement which sought to purify and reform the native religions of India. He came to England in 1870, and was well received by the Unitarians, with whom he had much in common, but he had little sympathy with orthodox Christianity. He founded and edited The Indian Mirror, and did much to reform the marriage laws of his country.

Kesseling, ALBERT (b. 1887). German air officer. An airman in the First Great War, he was a personal friend of Hermann Goering. In

1936 he became first chief of staff to the Luftwaffe; he later resigned, but was reinstated, and



Albert Kesselring,
German air officer

directed air operations against Poland in 1939 and against the Netherlands and France in 1940. He commanded an air formation on the Russian front, and in 1942 was promoted field-marshal and took command of the German air force in Italy. He was responsible for the occupation of Rome and its airfields, with the consequent dislocation of Allied plans, and in Sept., 1943, assumed command of all German forces in Italy. After the failure of the Ardennes offensive, Kesselring was named Rundstedt's successor in the west, but the situation was beyond even his military skill. Chosen in the final stages of the war to command the southern redoubt, on May 9, 1945, he was captured by the U.S. 7th army. In 1947 he was tried before a British court in Italy for having ordered the killing of Italian civilians, e.g. the massacre of more than 300 in the Ardeatine caves. He was condemned to be shot, but this sentence was commuted to one of life imprisonment.

Kesteven. One of the three divisions of the English county of Lincolnshire. Since 1888 it has been an administrative county with its own council, which meets alternately at Grantham and Sleaford. The full name is County of Lincoln, Parts of Kesteven, and the area is 724 sq. m. This is the central of the three divisions, and is watered mainly by the Witham. Pop. est. 113,320. See Lincolnshire.

Keston. Village and parish of Kent, England. It is 3½ m. S.E. of Bromley, and has a large common.

Kestrel OR WINDHOVER (*Falco tinnunculus*). A small bird of prey of the hawk tribe. The common



Kestrel, a small
hawk

kestrel is a resident in Great Britain and the lesser kestrel (*F. Naumanni*) a rare visitor in spring and autumn. It is called windhover from its practice of hovering almost motion-

less in the air before swooping on its prey. The plumage is reddish brown, lightly barred with black, while the head, neck, and tail are bluish grey. The average length of the bird is about 14 ins. The kestrel feeds almost entirely on mice and insects. It sometimes takes small birds and has been known to carry off a young chicken; but it is most useful as the destroyer of farm and garden pests. It nests in odd places, sometimes in holes in chalk pits. See Egg.

Kestrel. Fleet Air Arm establishment in Hampshire for training naval ratings as riggers, fitters, and ordnance artificers. Although officially entered on the navy list as a ship, the Kestrel is actually a land aerodrome. In 1939 a Goebbels-inspired broadcast from Berlin announced that the Germans had sunk H.M.S. Kestrel.

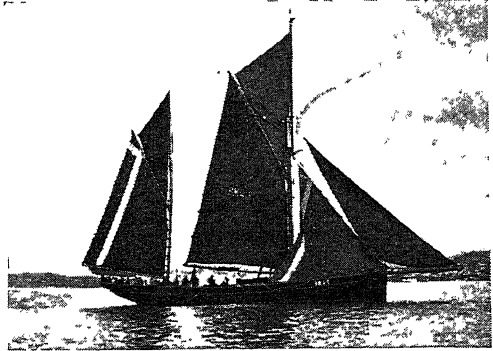
Keswick. A market town and urban dist. of Cumberland, England. It stands on the Greta, 13 m. S.E. of Cockermouth, on the railway. At the lower end of Derwentwater, and overlooked by Skiddaw, it is within easy reach of the most beautiful scenery of the Lake District. A religious convention is held here every summer. The town has a museum and a public park. Lead pencils are



Keswick. Seal of
district council

manufactured. The urban council owns the waterworks and markets. Market day, Sat. Pop. 4,635. See Druid Circle; Lake District.

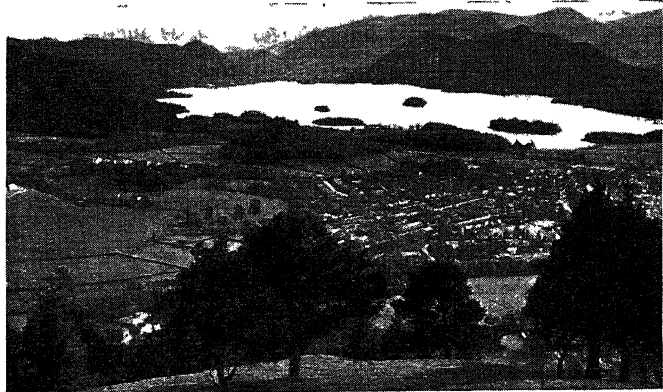
Ketch (Fr. *caïque*, small sailing boat). Two-masted sailing vessel formerly used in most parts of the



Ketch. This two-masted sailing vessel, once commonly used for short trips, still survives as a pleasure boat

world for short coastal journeys. It has a tall mainmast stepped well forward and a shorter mizzen mast aft, both being rigged fore-and-aft. Owing to their clear deck space amidships, square-rigged ketches were once used in warfare as mortar ships. Small fore-and-aft rigged yachts are sometimes called ketches.

Ketch, JACK (d. 1686). English public executioner. He was appointed to his office between 1662, when Edward Dun, the hangman, died, and 1678, when his name first appeared in a popular broadside. He is notorious for his bungling executions of Lord William Russell in 1683 and of the duke of Monmouth in 1685. For a few months in 1686 he lost his position and was confined in the Bridewell, but was reinstated on his successor being



Keswick, Cumberland. View overlooking this town of the Lake District, showing Derwentwater beyond

hanged. Ketch's name has passed into common use as a nickname for any hangman.

Ketchikan. Town of Alaska. It is on Revillagigedo Is. in the Alexander Archipelago off the N.W. of British Columbia. Pop. 4,695.

Ketchup (Malay *kēchap*). A sauce composed of mushrooms, tomatoes, or other vegetables, highly seasoned with spices.

Ketogenic Diet. Diet rich in fat and poor in starch and proteins. It is prescribed sometimes in the treatment of epilepsy, as it drains fluid from the system, thus easing nervous tension; and in cases of cystitis due to the bacillus coli, because it renders the urine an unfriendly breeding medium.

Ketones. A class of organic compounds containing in their simplest form a carbonyl group (CO) attached to monad hydrocarbon radicals. An example is acetone or dimethyl ketone, which is thus constituted: $\text{CH}_3\cdot\text{CO}\cdot\text{CH}_3$, the group of symbol CH_3 representing methyl. A ketone in which one methyl and one ethyl group is attached to the carbonyl group is called a mixed ketone.

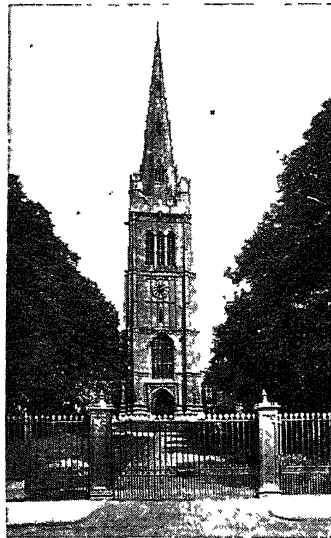
Compounds containing two carbonyl groups are diketones; those containing three, triketones. Other classes are fatty and benzene ketones according to the hydrocarbon with which the carbonyl group is united. The general process for preparing ketones is to distil the calcium salt of the corresponding acid. Acetone, for example, can be obtained by the distilling of dry calcium acetate. The word ketone is a corruption of acetone (Lat. *acetum*, vinegar). See Aldehyde.

Ketosis. A condition in which a form of oxybutyric and acetoacetic acids and acetone are excreted in the urine. It is due to deficiency of starch in the diet and so is associated with starvation, vomiting, diarrhoea, and severe diabetes. The chemical bodies are formed from fats, so that giving fats in diabetes accentuates the condition.

Kett, ROBERT (d. 1549). English rebel. He lived at Wymondham and was a landowner and lord of several manors in Norfolk, though popularly described as a tanner. When the disaffection due to the enclosure of common lands came to a head in the summer of 1549, Robert and his brother William placed themselves at the head of the Norfolk people and marched to Norwich, where they established a camp on Mousehold Heath. Twice Robert took Norwich, but

after defeating the first troops sent against him, his company was cut to pieces by large forces under the earl of Warwick. Kett was captured, tried in London, and executed in Norwich, Dec. 7, his brother being executed at Wymondham at the same time. Consult R. K. and the Norfolk Rising, J. Clayton, 1912.

Kettering. Market town and mun. bor. of Northants, England. 72 m. N.N.W. of London on the



Kettering, Northants. The beautiful 15th cent. tower and spire of the parish church of SS. Peter and Paul

railway. It dates from Anglo-Saxon times. In 1227 the grant of right to hold a market in Kettering was made by Henry III. Charter of incorporation dates from 1938. The main industries are the manufacture of boots and shoes, clothing, and leather. The Perp. church of SS. Peter and Paul has a beautiful tower with a fine lofty spire. A public library was presented by Andrew Carnegie and an art gallery contains a collection of works by Sir Alfred East, the gift of the artist. The Baptist Missionary Society was founded in 1792 in a house still standing in Lower St. Kettering gives its name to a co. constituency. Market day, Fri. Pop. 34,560.

Kettle (A.S. *cetel*). Vessel of metal for boiling liquids or cooking foodstuffs. The original kettle for boiling water had an open top

and was suspended from a crane over an open fire. Later it came to be made with a covered and lidded top and with a spout.

Steam-heated vessels for cooking or preserving foodstuffs, and for certain manufacturing processes, are termed kettles. The name was retained for certain open vessels (now lidded) used for cooking (e.g. fish-kettle). It also persists for the open paint-kettle or glue-kettle. In the electric kettle an immersion heater boils the water. In large-scale cooking and preserving, food is often cooked at a pressure either lower or greater than that of the atmosphere, so that the "open" vessel (subject only to atmospheric pressure) has been largely superseded by the vacuum pan, or by the pressure cooker or autoclave respectively.

Kettledrum (Ital. *timpano*, Fr. *timbale*, Ger. *Pauken*). Instrument of percussion, used in orchestras and cavalry bands. See Drum.

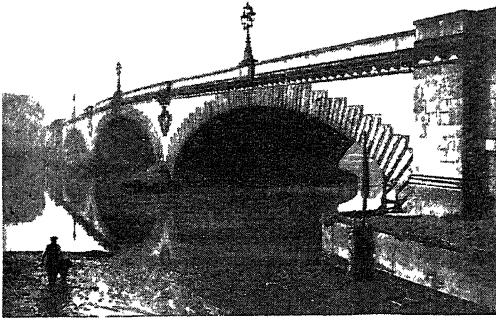
Kettle Hole. Name given to an irregularly shaped depression occurring in areas covered by glacial deposits. They are formed by the collapse of overlying material above masses of ice that have become separated from the main glacier and then covered by outwashed gravels or sands, etc. As the isolated ice masses melt, the surface above them slowly subsides, and a depression is produced. Kettle holes often form ponds or small lakes.

Keuper (Ger.). Upper division of the Triassic system. Consisting chiefly of a series of red marls, sandstones, dolomite, and gypsum beds, it is found in Germany and England, running over 3,000 ft. in thickness. In Cheshire the Keuper contains the chief deposits of rock salt in Great Britain. Keuper has fossils of saurian reptiles and the labyrinthodont. See Marl; Triassic System.

Kew. Suburb of London, England, in the bor. of Richmond, Surrey, on the right bank of the Thames. It is 5 m. W.S.W. by road from Hyde Park Corner, with District and suburban electrically connexions, and is linked by King Edward VII Bridge, opened 1903, with Brentford and Strand-on-the-Green. Near the centre of Kew Green, a space of 13 acres, is the parish church of S. Anne, 1714,



Kew, Surrey. The palace, a favourite residence of George III



Kew. King Edward VII Bridge (1903) over the Thames,
seen here from the Middlesex side

and at the W. corner the main entrance to Kew Gardens (*q.v.*). In the churchyard were buried Gainsborough and Zoffany, the artists; Aiton, the botanist; and Bauer, the microscopist.

The first mention of Kew is in a court roll of Henry VII, but discoveries made when the new bridge was being built suggest the existence of pile dwellings of considerable antiquity. Before 1769 Kew was a hamlet of Kingston. Notable residents have included Robert Dudley, earl of Leicester; Henry, Lord Capel; William Turner, the "father of English botany"; James Bradley, who here made discoveries in connexion with the aberration of light and the nutation of the earth's axis; and Sir Peter Lely.

Dudley's residence, rebuilt 1631, and known as the Dutch House, was bought by George III in 1781, was later called Kew Palace, and in it

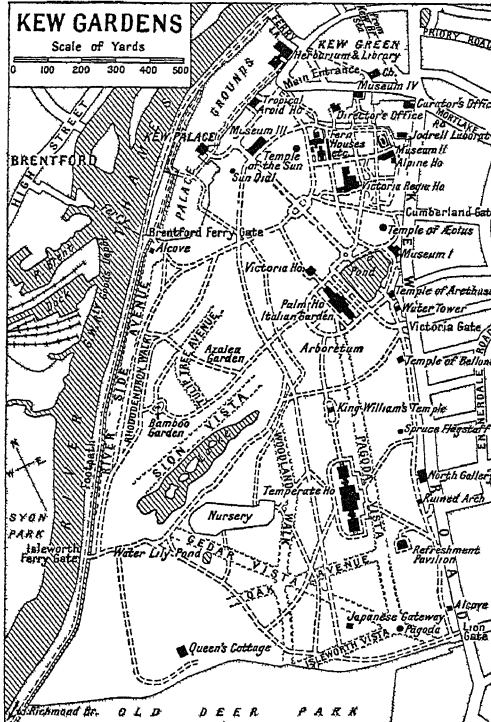
Queen Charlotte died. Opened to the public in 1897, it contains souvenirs of George III and his family. Adjoining was the White House or Old Palace, pulled down in 1803, residence in 1731-51 of Frederick, prince of Wales. In the adjoining Old Deer Park is the

site of Richmond Lodge, a favourite home of George II, which was pulled down in 1772. Kew Observatory is noticed separately. Pop. 2,792.

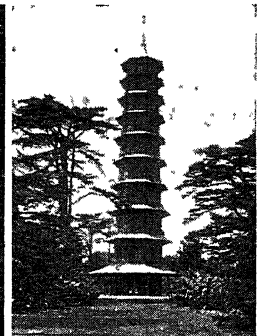
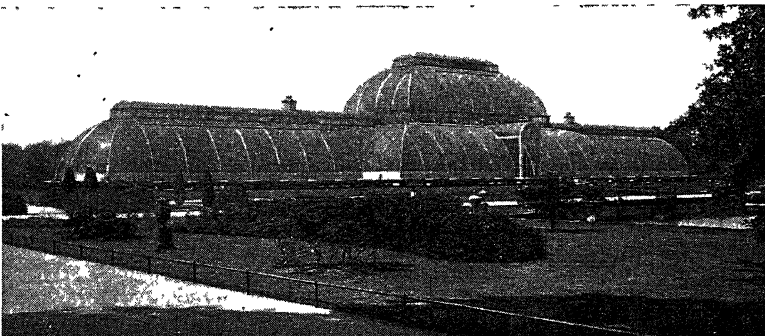
Kew Gardens. Popular name for the Royal Botanic Gardens at Kew, Surrey, England. Covering 302 acres, they were formed from the ground attached to Kew Palace and Richmond Lodge, properties divided formerly by a bridle path, Love Lane. This extended from Richmond Green to the old horse ferry superseded in 1758-59 by the first stone bridge between Kew and Brentford. In

the gardens of Richmond Lodge, Scott, in *The Heart of Midlothian*, laid the scene of the interview between Queen Caroline and Jeanie Deans.

Kew House became the property of Lord Capel, an ardent horticulturist and collector of exotic plants. Later the lease was acquired by Frederick, prince of Wales, whose widow, assisted by the earl of Bute, Chambers, the architect, and Aiton, author of the *Hortus Kewensis*, 1789, laid the foundations of the existing gardens. George III acquired Richmond Lodge and Kew House, and linked the two demesnes about 1770. Sir Joseph Banks was unpaid director of the gardens, 1772–1820, and began the systematic introduction of plants from abroad. Cobbett worked here as undergardener. Banks's successors have included Sir W. Hooker, Sir Joseph Hooker, Sir W. Thistlethorn Dyer, Sir David Prain, Sir Arthur Hill.



**Kew Gardens. Plan based upon Ordnance Survey with
sanction of Controller of H.M. Stationery Office**



Kew Gardens. Left, the Palm House, built 1844-48: length, 362 ft.; height, 66 ft.; containing almost every known variety of palm. Right, the Pagoda, built in 1761, 163 ft. high

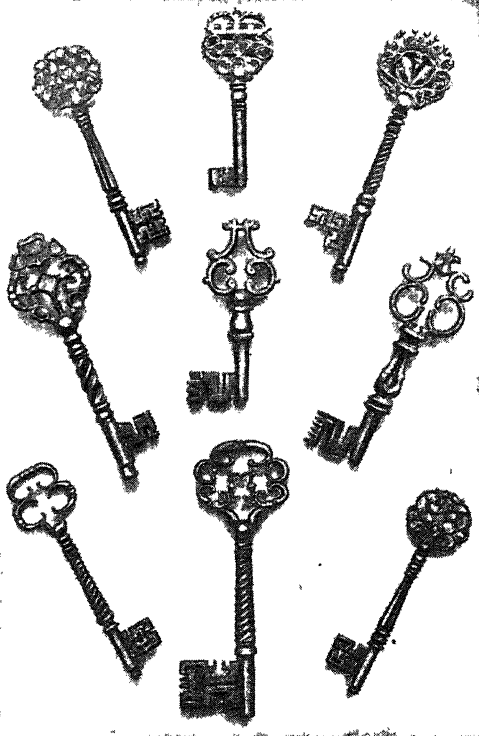
Frith

The gardens, which were opened to the public in 1841, contain museums, palm house, temperate house, Victoria Regia house, herbarium, arboretum, laboratory, library, and lake. The grounds of Queen's cottage, built by George III and opened to the public in 1897, form a sanctuary for wild birds. The main functions of the institution are the advancement of the study of plant life, and the introduction of new and valuable plants into Greater Britain. Cinchona was introduced into India in 1860, and Para rubber into the Malay peninsula in 1875. Within the grounds are upwards of 24,000

different species and varieties of plants systematically arranged. In 1920 a flagstaff of Douglas fir was erected in place of the one set up in 1861; the gift of British Columbia, the present flagstaff is 214 ft. high. *Consult The Royal Botanic Gardens, Kew, W. J. Bean, 1908.*

Key Observatory. Institution situated in the Old Deer Park, Richmond, Surrey. Built in 1769 as a private astronomical observatory for George III, it stands almost on the site of a Carthusian priory founded by Henry V. The "king's observatory" furnished observations necessary for regulating the king's (and London) clocks; later this service was assumed by the royal observatory at Greenwich. Since 1842, when the building was lent by the crown to the British Association, the observatory has been devoted to meteorology and the cognate branches of physics. From 1854 it has occupied a conspicuous place in meteorology. Instrument testing, for fees, began then, the income eventually maintaining the observatory.

In 1900, then controlled by the Royal Society, the observatory formed the nucleus of the National Physical Laboratory; and ten



Key. Examples of chiselled steel keys of the 16th and 17th centuries

years later, when most of the verification work had been transferred to Teddington, it became a part of the Meteorological Office. But by 1867 Kew was functioning as the central observatory of seven operated in the British Isles by the Meteorological Office. Recording instruments perfected about this time at Kew are still in use both in the U.K. and overseas.

Meteorological work today provides information as a basis for study of the atmosphere. Self-registering instruments continuously record the air temperature, barometric pressure, rainfall, sunshine, wind force and direction, solar radiation, and daylight. During the Second Great War an important task allotted to Kew was the development of the British radio sonde from an original design supplied by the N.P.L. The atmospheric electrical programme includes study of the atmosphere in fine weather and under disturbed conditions, and of electrical charges associated with rain and snow. An important series of balloon soundings added much to our knowledge of the distribution of electricity in thunder-clouds. Kew is also the principal seismological station in the

U.K., and is equipped with seismographs for the recording of near and distant earthquakes. Terrestrial magnetism was once the branch of geophysics which received most attention, but the development of electric rlys. affected the records, so the magnetographs were removed in 1925 to Eskdalemuir, Dumfriesshire.

Key. Instrument for shooting or drawing backwards the bolt of a lock. The term is applied also to other tools which by their operation enable one member of a machine or an appliance to be fixed to another member at will. Keys for locks (*q.v.*) are so shaped as to engage with wards or tumblers and free the bolt; further movement of the key shoots or withdraws the bolt.

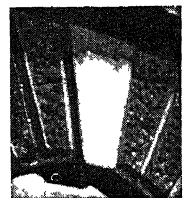
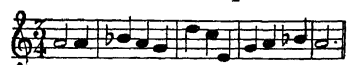
A tool used for turning a nut or coupling-piece of a machine or structure is called a key.

In engineering practice a key is a piece of metal driven in or inserted between two elements of a machine (*e.g.* a flywheel and its shaft) or structure with the object of securing them together rigidly. A common form is a rectangular tapered metal piece, long and narrow, fitting into corresponding key-ways in two members. Another form is a spline, or feather having parallel faces which permit sliding of one element relatively to another, used *e.g.* with the sliding member of a clutch.

A sunk key is fitted in a recess; a saddle key rests upon a shaft or its equivalent; a gib key has a head which facilitates its withdrawal; a feather key, known as the Woodruff key, is shaped, and fits into a similarly shaped recess milled out in the members.

Key. In architecture, member which retains together the parts of a fabric, *e.g.* the key stone of an arch, which by its position and wedge shape locks and holds the structure together.

Key. In musical terminology, word primarily denoting a group of scale-sounds so related to one another as to give the ear a definite sense of the sound which is their starting point or key note (Tonic-Solfa Doh), even though the keynote itself be not heard. For example:



Key stone of an arch

is clearly in key F, though the note F does not appear. Key is also the term applied to the levers or keys which actuate the mechanism of the pianoforte, organ, and similar instruments; the levers which control the side holes in wood-wind instruments; the tuning key or hammer used for turning the tuning pegs of the pianoforte and similar instruments; and the metal handles used for tuning the kettledrum, by altering the tension of the skin. It is also the old term for the signs of pitch, now more commonly called clefs, here shown. Left, G or treble; centre, C or tenor; right, F or bass. See Key Signature.



Key Bugle. Brass musical instrument of soprano pitch, with keys, also called the Kent bugle. See Bugle; Kent Bugle.

Keyes, ROGER JOHN BROWN-LOW KEYES, 1ST BARON (1872-1945). British sailor. Born Oct. 4,



Lord Keyes,
British sailor

1872, the son of Gen. Sir Charles Keyes. He entered the navy in 1885. From 1905 to 1907 he was naval attaché in various European countries, and in 1912 was made commodore in charge of the submarine service. His active service during the First Great War began at Heligoland Bight, and in 1915 he became chief of staff to the E. Mediterranean squadron. Commander of the Dover Patrol, he carried out the spectacular raid on Zeebrugge, April 23, 1918. Rear-admiral from 1917, he was knighted after this exploit, and in 1919 was made a baronet and awarded a grant of £10,000. In 1925 he became c.-in-c. of the Mediterranean Fleet, and in 1929 at Portsmouth. Promoted admiral of the fleet in 1930, he retired from the active list in 1935 and, returned at a by-election in 1934 as Conservative M.P. for N. Portsmouth, he sat until 1943, when he went to the Lords.

Restored to the active list in 1940, Keyes was flown to Belgium on May 10 as additional naval attaché for special liaison with King Leopold, whom he hotly defended after the Belgian surrender. Keyes directed Combined Operations (*q.v.*), but his appointment was terminated in Oct., 1941,

a decision he attacked in parliament. In 1944 he toured America and the dominions, and visited the S.W. Pacific. Flying over Leyte, he was gassed by a toxic smoke screen, and the resulting heart strain contributed to his death on Dec. 26, 1945.

Among Lord Keyes's publications are Naval Memoirs, 1934-35; Adventure Ashore and Afloat, 1939; The Fight for Gallipoli, 1941; Amphibious Warfare and Combined Operations, 1943. His eldest son, Lieut.-Col. Geoffrey Keyes, died in winning the V.C. at the head of the commando which raided Rommel's headquarters in Libya, June, 1942. The title passed to the second son, Roger (b. March 14, 1919).

Keyes, SIDNEY ARTHUR KILWORTH (1922-43). English poet. He was born at Dartford, May 27, 1922, and educated at the grammar school and Tonbridge. In 1940 he went as history scholar to Queen's College, Oxford. Entering the army in 1942, he was taken prisoner by the Germans in Tunisia, and died April 29, 1943. Keyes was one of the most gifted young poets of the Second Great War, and in 1944 was posthumously awarded the Hawthornden prize for his two volumes, *The Iron Laurel* and *The Cruel Solstice*. His collected poems were published in 1945.

Keyham. District of Devonport, included in Plymouth, England. It stands on the Hamoaze, and has its own railway station. The district forms the N. part of the Royal Dockyard, Devonport, and is equipped with wet and dry docks, engineering shops, and facilities for ship repairs. There is also a Royal Naval barracks.

At the Royal Naval engineering college, established in 1880 and commissioned as H.M.S. Thunderer in 1947, junior engineer officers take their technical and theoretical courses. When the college was first opened, naval engineer officers were non-executive and quite separate from deck officers. The Selborne scheme, which aimed at obtaining commissioned naval engineers from the Dartmouth and Osborne cadets, led to the closing of the college in 1910. In the First Great War it was devoted to training naval cadets from the public schools. In 1919 it reverted to its original functions. Starting as cadets (E) and midshipmen (E), officers spend three years and eight months' training at Keyham, and then are posted to seagoing ships as lieutenants (E). See Engineer Officer.

Key Industry. Term applied in general to any industry or manufacture regarded as essential to the economic prosperity of a nation. In Great Britain the principal key industry is coal mining. Specifically, the description was used in the First Great War to distinguish any industry upon which the efficiency of the military effort depended, and was also applied to new industries—dyes, optical glass, synthetic drugs—which, hitherto a preserve of foreign countries, were set up and protected by legislation in the U.K. In the Second Great War, legislation relative to key industries was enforced under the Essential Works Orders (*q.v.*).

Keyne. Welsh or Cornish saint. She is said to have lived in Wales about 485, and to have removed to Cornwall, where a famous well bears her name. According to another account, Keyne was a daughter of Prince Braghan of Wales, and lived as a recluse in a wood not far from Bristol, where fossil ammonites were formerly supposed to be snakes turned into stones by her prayers.

Keynes, JOHN MAYNARD KEYNES, BARON (1883-1946). A British economist. Born June 5, 1883, a son of J. N. Keynes, the Cambridge scholar, he was educated at Eton and King's, Cambridge. He entered the India office in 1906, but two years later returned to King's to lecture on economics. He joined the Treasury in 1915, and was its principal representative at the Paris peace conference, deputy for the chancellor of the exchequer on the supreme economic council. Strenuously opposing what he considered excessive reparations from Germany, he resigned and became bursar of his old college. His *Economic Consequences of the Peace*, 1919, was much quoted.



Lord Keynes,
British economist

In the Second Great War he was recalled to the Treasury as a member of the chancellor's council, and was a director of the Bank of England. He propounded the idea of deferred credits in How to Pay for the War, 1940. Author of the Keynes Plan for an international monetary authority, in 1944 he led the British delegation to the world conference at Bretton

Woods. A member of the British delegation which negotiated the American loan in 1945, he was soon appointed governor of the International Monetary Fund and of the International Bank for Reconstruction and Development. He had long been in poor health, and on April 21, 1946, he died.

Though accused by some of inconsistency, Keynes was perhaps the most influential British economist since Adam Smith. Books like *The End of Laissez-Faire*, 1926, and *General Theory of Employment, Interest, and Money*, 1936, were imaginative and stimulating. He edited the *Economic Journal* from 1912 and was secretary of the Royal Economic Society. In politics a Liberal, he was made a peer in 1942. Keenly interested in the arts, he organized the Camargo ballet; founded the Arts Theatre, Cambridge; was a trustee of the National Gallery; and chairman of C.E.M.A., later the Arts Council. In 1925 he married the ballerina Lydia Lopokova.

Geoffrey Langdon Keynes (b. March 25, 1887), his brother, was a surgeon, bibliophile, and devotee of the ballet. He was a trustee of the National Portrait Gallery, and an authority on Blake, Izaak Walton, and Sir Thomas Browne, whose writings he edited.

Keys, HOUSE OF. Lower house of the legislature of the Isle of Man. Of great antiquity, it is composed of 24 commoners elected for five years, on a property qualification, by male and female suffrage. With the upper house, it constitutes an independent parliament meeting in the court of Tynwald. The island is not subject to Acts of the Imperial parliament except where specially important. The word Keys is commonly explained as an English corruption of the Manx *Kiare-as-feed*, twenty-four. See Man, Isle of; also Cinematography illus. p. 2101.

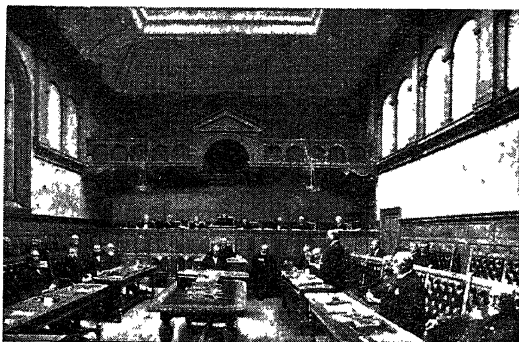
Keys, NELSON (1886-1939). British comedian. Born Aug. 7, 1886, he began his stage career at Hull in 1906, and made his London debut in The Arcadians three years later. A master of mimicry, he appeared in musical comedies and revues, e.g. The Passing Show, 1914; Folly to be Wise, 1931;



Nelson Keys,
British comedian

Bow Bells, 1932. His range of impersonation included such varied types as a Spanish mandolinist, racecourse tipster, German waiter, and Japanese juggler. After 1927 he was seen in many films. He died April 26, 1939.

Keyserling, HERMANN, COUNT (1880-1946). German philosopher. Born of Baltic stock in what is now Estonia, July 20, 1880, he was educated at Dorpat (Tartu) university. His first philosophical work, *Das Gefüge der Welt*, appeared in 1906; later came *Prolegomena to Natural Philosophy*. After the First Great War he acquired German nationality, married Bismarck's granddaughter and founded a school at Darmstadt. His most famous work was translated into English as *The Travel Diary of a Philosopher*, 1925. From the individual psychology of his earlier works he



House of Keys. Meeting of the House and Council which constitute the parliament of the Isle of Man

passed to psychological analysis of nations: in *Der Spektrum Europas*, *America Set Free*, and *South American Meditations*, 1926-32, he tried to interpret countries and races from natural environment, biological characteristics, and social history. He was an opponent of Hitler and his writings were banned by the Nazis. He died at Innsbruck, April 26, 1946.

Key Signature. Signs at the beginning of the musical stave which indicate the pitch of the keynote on *Doh*. The keys of C major and A minor have the clef alone; the other keys are indicated here:

Similar groups of sharps or flats are used with the F clef and the C clef.

Some extreme keys are simplified in appearance by using an enharmonic change; e.g. Key B for C flat, or D flat for C sharp.

Key West (Span. *Cayo Hueso*, Bone Reef). City and port of entry of Florida, U.S.A., the co. seat of Monroe county and the southernmost city of the U.S.A. It stands on Key West Island, the westernmost of the Florida Keys. It is served by steamship lines to Tampa, Havana, and other ports, and is connected with the mainland by the Overseas Highway, 131 m., completed 1938 to replace the Florida E. coast rly. extension destroyed in a hurricane, 1935. Key West is a winter health resort and a U.S. naval station and coast-guard base, with a good harbour defended by Fort Taylor. The principal buildings are the city hall and the county court house, an art gallery, and a merchant

seamen's hospital. Subtropical flora and fauna of the area are displayed in an aquarium, an arboretum, and an aviary.

Fishing, sponge-fishing, turtle-soup canning, and cigar making are the principal industries, the last having declined from its

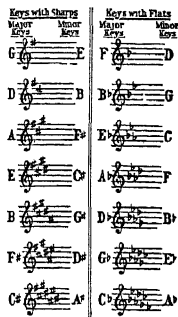
former primary importance.

Settled in 1822, Key West became a city in 1832. It was the only Southern city to remain with the Union all through the Civil War. Pop. 12,927.

The island of Key West, 60m. from C. Sable, is about 4 m. long and 1 to 2 m. broad. Some of its tropical plants are found in no other part of America.

Kha. Lao collective name for aboriginal hill tribes of Indonesian stock in Indo-China, the Annamese name being *Moi*. Numbering perhaps 600,000 in Indo-China and much fewer in N. Siam, they are short, thick-set, ruddy-yellow, level-eyed, long-headed, primitive animists. Occupying palisaded villages in upland forest clearings, they hunt with cross-bows and bamboo arrows. See Gurkha.

Khabarovsk. A town of the R.S.F.S.R. It is the principal city of the Far Eastern region, situated near the junction of the Amur and Usuri on a branch of the



Trans-Siberian rly. It is close to the Manchurian border. A collecting centre for the fur trade, its industries include tanning, brewing, and distilling. There are refineries for the oil brought by tankers from Sakhalin. There are a museum, technical and other schools, and a wireless station. The town was named after a Russian merchant and explorer who built a fort on the present site in 1652. Pop. 199,364.

Khabur. River of S.W. Asia. It rises in the Karaja Mts., in the Turkish vilayet of Mardin, and after a course of 200 m. flows S. through Syria into the Euphrates.

Khachaturian, ARAM I. (b. 1904). A Russian composer. Born in Tbilisi, he studied music at the Moscow conservatoire, graduating in 1934. His early works included a trio for clarinet, violin, and piano; a sonata for violin and piano; dance suite for orchestra; and first symphony. These were followed by a piano concerto and violin concerto; Poem to Stalin, for orchestra and chorus; Song for Stalin, for brass band; a ballet, Happiness; and his second symphony. He wrote patriotic songs for the army, incidental music for Armenian state theatre productions, and for films, the theme song of Pepo becoming a national song. His music is rooted in the folklore of Caucasia. In 1939 he was awarded the Order of Lenin.

Khadija (556-619). The wife of Mahomet. Daughter of Khuwalid and twice widowed, Khadija was wealthy, about 40 years old, and 15 years his senior when she married the prophet. She bore him three sons and four daughters. See Mahomet.

Khafrā. An Egyptian king of the IVth dynasty. The Chephren of Herodotus, he built the second pyramid of Gizeh; the tomb-chamber contains a granite sarcophagus. In the monumental approach to the pyramid, a granite and alabaster edifice misnamed the temple of the Sphinx, Mariette found in 1853 a magnificent green diorite statue of the monarch, and débris of eight other statues, now in Cairo.

Khairagarh. Former state of central India, between Crondia and Drug, now part of Madhya union. After the lapse of the Nagpur state in 1853, Khairagarh resumed its individuality in relation with the British. The state acceded to the dominion of India in 1947. The inhabitants are chiefly Gonds, with Lodhis, Chamars, and Ahirs. Khairagarh is the capital. About

two-thirds is under cultivation, the chief crops being millet, rice, and wheat. The ruler was a raja. Area, 913 sq. m.; pop. 173,713, nearly all Hindus.

Khairpur. A state formerly in Upper Sind, and now included in Punjab, Pakistan. It lies between the Indus and the Thar desert. Of the total area of 6,050 sq. m., about one-fourth is under cultivation, millet and wheat being among the crops. The industries include the manufacture of cotton goods. Grain and cotton are the principal exports, the imports including piece goods. The state was founded in 1786, and stood by the British in the troubles of 1857. Its prosperity has been greatly increased by the construction of the Rohri canal as part of the Lloyd barrage scheme. The chief has the title mir, and is entitled to a salute of 15 guns. Khairpur municipality is on the rly. from Hyderabad, Sind, to the Punjab. Pop., state, 305,787; town, 17,510.

Khakas. Autonomous province of the R.S.F.S.R. Situated in the Western Siberian region, it is on



Khafrā, king of Egypt, builder of the second pyramid of Gizeh
From a statue in the Cairo Museum

the Upper Yenisei, N. of Tuva. The chief town is Abakan.

Khaki (Hind., dust). A dust-coloured fabric used for military uniforms. Introduced by Sir H. B. Lumsden, it was first used by the corps of guides in 1848. It was first worn by troops in the British army during the Indian Mutiny, in the second Afghan War, 1878-80, and in the South African War, 1899-1902, on account of its comparative invisibility, especially in sandy countries. Thereafter khaki became the standard colour for

British army uniforms, only the Guards and Household Cavalry wearing full dress in peace time. Several other nations adopted the same tint for their uniforms.

Khaki Election. Name given, chiefly by the unsuccessful Liberal party, to the general election of Oct., 1900. This was held during the S. African War at a time when the tide had turned in favour of British arms, and the Liberals claimed that the Unionist government, in appealing to the country for a mandate to conduct the war to a successful conclusion, was exploiting for its own ends the intensely patriotic mood of the moment. The Unionists gave assurance that if returned to power they would introduce no controversial measures affecting domestic politics, and thereby secured many Liberal votes, 402 Unionists being returned as against only 186 Liberals; but in the event this promise was not strictly kept, a fact which contributed to the overwhelming Unionist defeat at the polls in 1906. The 1918 election is also sometimes called the "khaki election" but usually the "coupon election." See Coupon.

Khaki University. An educational organization set up at Watford, Herts, in Sept., 1945, by the Canadian military authorities for the post-war education of their serving men and women while awaiting repatriation to Canada. On the faculty were represented 21 Canadian universities and every prov. of the Dominion. Students included all ranks, and two terms counted as a full university year at home. The university completed its last term in April, 1946. Similar organizations were set up at Witley, Surrey, and at other Canadian army camps during the First Great War, and there was one at Vimy Ridge in France. Khaki universities were also set up for British troops at home and overseas.

Khalifa, THE. An Arab word meaning successor, adopted as his title by Abdullah el Taashi (1846-99), the successor of the Mahdi (q.v.). Born in Darfur, he was one of the Baggara Arabs engaged in the slave trade who resisted the Egyptian annexation of his native province. On his way to Mecca, he came into contact with Mahomed Ahmed, the native of Dongola who was then plotting a general insurrection. Chiefly owing to Abdullah's influence, the wild tribes of the southern Sudan acknowledged Mahomed as a prophet, and Abdullah speedily became the Mahdi's confidential adviser, and

on his death, June, 1885, succeeded to the tyranny.

Abandoning Khartum, he established himself at Omdurman, and by 1890 had become supreme in the southern Sudan, maintaining his authority by ruthless cruelty and military skill. His power was broken by Kitchener at Omdurman (*q.v.*), Sept. 2, 1898. The khalifa escaped to Kordofan, but was overtaken Nov. 25, 1899, at Om Debrikah, by Anglo-Egyptian forces. The khalifa, five of his emirs, and 1,000 dervishes were killed in the battle. See Egypt.

Khalka OR **KALKHA**. People of Mongol stock, mostly in N. Mongolia. Perhaps numbering 200,000, brownish-yellow, of medium height, roundish-headed, flat-nosed, they are hardy, horse-loving, tent-dwelling tribesmen, herdsmen, and hunters. They represent the Tartar power which reached its zenith under Jenghiz Khan.

Khama (1835-1923). Bamangwato chieftain. Head of his tribe in the N. of Bechuanaland, in 1872



Khama, Bamangwato chieftain

he appealed for British help against the Boers. Fourteen years later Bechuanaland was made a protectorate. As a result of his visit to London in 1895, his country was made a native reservation, and in 1903 he built Serowe, his capital. He died Feb. 20, 1923. For the controversy arising from the marriage of his grandson, Seretse Khama, see Bamangwato in N.V.

Khamgaon. Town of India, in Buldana district, Berar. It is a cotton trade centre and the terminus of a branch rly. from Shegaon. The business of the town is of little value except during the seven months of the cotton season. Pop. 26,402.

Khamsein (Arab., fifty). Name given in Lower Egypt to the hot S. winds which blow in front of depressions moving E. along the Mediterranean or N. Africa. This dry and often dusty wind occurs between April and June, when it is reputed to blow for about 50 days. In Mediterranean regions it is referred to as the sirocco (*q.v.*).

Khan. Oriental title meaning lord. Jenghiz, the Mongol ruler, was the first to call himself khan, and after his death the Mongol emperors were known as the great

or grand khans or chams. In central Asia certain chieftains are still called khans.

Khan, **LIAQAT ALI**. Pakistan statesman. See N.V.

Khan Bagdadi. Town of Iraq in the liwa of Dulaim. Situated on the Euphrates about 20 m. above Hit, it is an important point on the caravan road to Aleppo, and is 105 m. N.W. of Bagdad. During the First Great War it was the scene of a battle on March 26-27, 1918, when the British defeated the Turks and pursued them 73 m. along the Aleppo road.

Khandagiri. Sandstone hill in India, in Puri dist., Orissa. Khandagiri and Udayagiri are two hills separated by a narrow gorge and rising abruptly from the plain 5 m. E. of Bhuvneswar. They are honeycombed with Jain and Buddhist cave dwellings and cells carved out of the rock more than 2,000 years ago.

Khandesh, **EAST AND WEST**. Two districts in India, in the central division of Bombay. Of the total area over half is under cultivation, millet and cotton being the chief crops. The Khandesh valley is watered by the Tapi river and contains large areas of black cotton soil. The industries include the manufacture of cotton goods. Jalgaon is the capital of East, Dhulia of West, Khandesh. Area, East, 4,550 sq. m.; West, 5,439 sq. m. Pop., East, 1,327,722; West, 912,214.

Khandwa. A subdivision and town in India, in Nimar district, Madhya union. About half is under cultivation. Khandwa town contains cotton ginning and pressing factories, and is a trade centre and rly. junction. Area of subdiv., 1,871 sq. m. Pop. subdiv., 211,762; town, 38,493.

Khania. Variant spelling of the capital of Crete, better known as Canea (*q.v.*).

Khanka, **HANGKA**, OR **HINKA**. Lake on the frontiers of Manchuria and the Far Eastern region of the U.S.S.R. It is 100 m. N. of Vladivostok, and is 60 m. long and 35 m. broad. The Vladivostok-Khabarovsk rly. runs close to its E. shore.

Khan-Tengri OR **KAR-GÖL-BAS**. The highest peak of the mountain system of Tian-Shan in Central Asia. It is to the E. of Lake Issik-Kul, on the borders of Kirghiz S.S.R. and Sinkiang, China, and it has numerous glaciers. Its height is about 24,000 ft.

Kharan. State of Baluchistan, Pakistan. Formerly part of Kalat, it is a hilly tract S.E. of Chagai

district and touches the borders of Persia and Makran. During 1940 it was a separate state under the suzerainty of Kalat. Area, 18,500 sq. m.; pop. 33,763.

Khargeh, in full, **WAHIA EL KHARGA**. Oasis in Egypt. Lying in a deep depression, it is about 125 m. S.S.W. of the Nile at Assiut. The town of Khargeh is connected by rly. with the main Egyptian rly. It forms part of the Great Oasis known to the Romans, and contains many ruins, among them early Christian chapels and tombs and the remains of a Roman fortress at El Dir.

Kharkov. City of the Ukraine S.S.R. Second largest place in the republic, and fourth in Russia, it stands on three small streams which flow into the Uda, a tributary of the Donetz, 250 m. E. by S. of Kiev. An important rly. junction, its industries include iron smelting and the manufacture of tractors, machinery, machine tools, electrical equipment, rope, and chemicals. There are air services to Moscow, Kiev, and Odessa, with industries in connexion with them. The city gives its name to one of the richest regions in the "black earth" belt; wheat, buckwheat, beet, sunflowers, cotton, and flax are raised, and before the Second Great War this region yielded about a quarter of the grain of the U.S.S.R. There are a university and an agricultural and economic institute. Pop. 833,432.

The city was founded in 1654 as a fort of the Free Ukraine and was an outpost of Moscow during its conflict with the Tartars. During the rebellions of the 17th century, the Cossacks of Kharkov remained loyal to the tsar; and the city became the administrative centre of the Ukraine in 1765. Industrial development in the Donetz coalfield and the Krivoi Rog iron district during the later 19th century led to its growth.

During the German offensive of 1941, Kharkov was heavily bombed by the Germans, who captured it Oct. 29. The Russians recaptured it on Feb. 16, 1943, after bitter fighting; were compelled to evacuate it on March 15; but on Aug. 23 finally took the city, which had been largely destroyed. It was the scene in Dec. of the first trial of war criminals, three Germans and one Russian being found guilty of mass extermination of civilians and publicly hanged, Dec. 19, 1943.

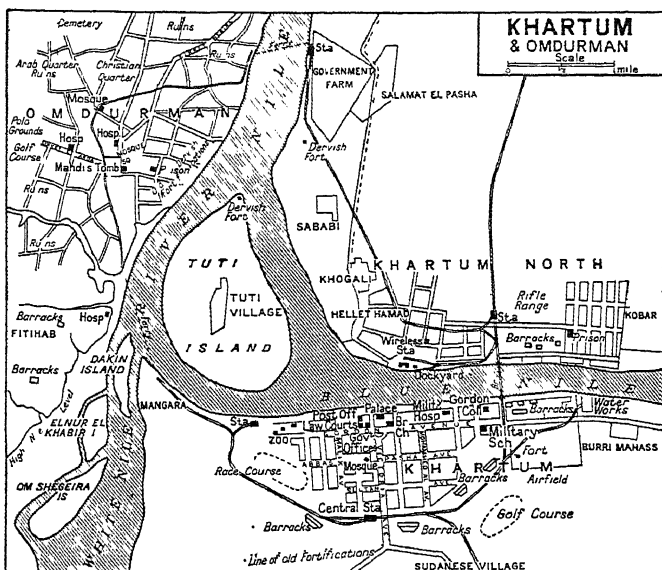
Kharsawan. Former Indian state, now in Bihar. It lies in an enclave between the Singhbhum

and Manbhūm districts of Bihar. The chief place is a village of the same name. Half the people are primitive animists. Area, 157 sq. m.; pop. 50,580.

Khartum. The capital of the Anglo-Egyptian Sudan. It stands at the junction of the Blue and the White Nile, 430 m. S.W. of Port Sudan and 1,345 m. S. of Cairo. It is connected by rly. with Sennar and El Obeid in the S., with Port Sudan on the Red Sea, and with Wady Halfa on the N. There is a service of steamers to Juba. The city proper is on the S. side of the Blue Nile, across which is Khartum North, a bridge, finished 1910, connecting them. Khartum province has area 57,000 sq. m. and pop. 329,000.

Rebuilt after its destruction in 1885, Khartum is planned on modern and spacious lines. The chief buildings, which stand on the embankment, 3 m. long by the river, and on the Gordon Avenue, include the Anglican cathedral, in the Byzantine style, and several churches and mosques for different faiths. This is the seat of a bishop. The palace of the governor-general occupies the site of the one in which Gen. Gordon lived. Other buildings are government offices, hospital, clubs, and the barracks. There are public gardens, a race-course, and golf links. A bronze statue of Gordon adorns the town, and here is the Gordon memorial college, with museum and laboratories founded by W. S. Wellcome. The city has zoological gardens. The trade of the Sudan passes through here, being carried both by river and rail.

Khartum was founded in 1830 by Mehemet Ali, but was destroyed by the Mahdists on Jan. 26, 1885, when Gordon, who had made it his headquarters, was killed. In 1898, after the battle of Omdurman, the British recovered the site and proceeded to restore the town. Omdurman, just outside, was the Mahdist capital. In the Second Great War, Khartum was the main base for the forces which conquered Eritrea and freed Abyssinia in 1941. It was also the terminus of the West African reinforcement route, over which aircraft were flown from Takoradi



Khartum. Map of the capital and of Omdurman, the two chief cities of the Sudan, standing at the confluence of the Blue and White Niles. Khartum was replanned after 1885

on the Gold Coast. (See East Africa Campaign.) Pop. 61,800. See Gordon; Kitchener; Omdurman, Battle of; Sirdar.

Khasi. Primitive hill tribe in the Khasi and Jaintia Hills districts, Assam. Numbering (1941) 192,919, they are short, brown, level-eyed, lank-haired, medium-headed cultivators of Austroasian type, speaking a Mon-Khmer dialect.

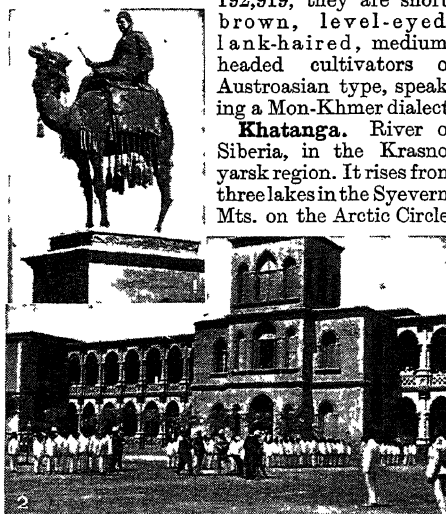
Khatanga. River of Siberia, in the Krasnoyarsk region. It rises from three lakes in the Syeverm Mts. on the Arctic Circle,

Siberia. Its breadth at the entrance is 40 m., at its S.W. end 70 m., and its length is 170 m. The bay, little known, abounds in fish, and contains several small, desolate islands.

Khatmandu. Capital of Nepal. Believed to have been founded about 723, and to have taken its name from an ancient building in the city, it is remarkable for its straggling character and narrow streets. There are many temples. Outside the city are the palaces of the maharaja and the nobles. See illus. p. 4820. Pop. 108,805.

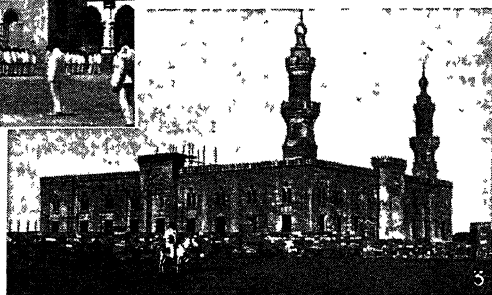
Khaya (*Khaya senegalensis*). A tall tree of the family Meliaceae. It is a native of W. Africa. The timber, which is much like the real mahogany, is known as African mahogany. The bark is used medicinally in fevers.

Khazar OR CHAZAR. Ancient people in S.E. Europe. Their tall,



and discharges itself into Khatanga Bay, in the Arctic Ocean, to the E. of the Taimur peninsula, after a course of 460 m.

Khatanga Bay. Inlet of the Arctic Ocean in N.W.



Khartum. 1. Gordon statue, bronze copy of the statue by Onslow Ford in the R.E. Mess, Chatham. 2. Gordon Memorial College. 3. Principal mosque



Khatmandu, Nepal. The former British residency on the outskirts of the city. See page 4819

fair aristocracy, perhaps of Georgian affinity, and of reputed descent from the royal Scythians, overlorded the short, dark, nomad Ugrian population between the Volga and the Don. Emerging in the 2nd century A.D., they controlled for centuries the caravan trade between the Black Sea and the Caspian, with an opulent mart at Itil, near Astrakhan. In the 10th century they succumbed to the E. Roman empire.

Khedive (Pers. *khidiw*, prince). Title of the viceroy of Egypt. It was granted in 1867 by the sultan of Turkey to Ismail Pasha, and existed until Dec., 1914, when the khedive Abbas Hilmi was deposed by the British and a sultan installed in his place. See Abbas II; Egypt.

Kheri. A district of India in the Lucknow division of Uttar union, W. of the Gogra and bordering Nepal. About one-third is under cultivation, wheat, rice, and maize being among the chief crops. Exports include grain, sugar, and forest produce; imports, piece goods and metals. The area of the dist. is 2,972 sq. m. Pop. 1,024,025.

Kherson. A town of Ukraine S.S.R. and capital of the region of the same name. It stands on the right bank of the Dnieper, 20 m. from its mouth and 90 m. E. of Odessa. Rlys. run to Odessa and Dnepropetrovsk. The chief industries are tallow and soap boiling, wool washing, brewing, and tobacco manufactures; a large trade is done in timber, cereals, hides, and furs. Marble, iron, and granite occur in the region. Named after the old Greek colony in the Crimea, Kherson was originally built by Potemkin as a naval harbour. Howard, the English prison reformer, died here and is buried near. Pop. 97,186.

Kherson fell to the Bolshevik troops in 1920 in their campaign against Denikin. It was captured

on March 13, 1944, after fierce street fighting.

Another Kherson, 2 m. W. of Sevastopol, was for long the chief Byzantine possession N. of the Black Sea. It was captured by the Russians under Vladimir the Great in 988, and has not recovered from its devastation by the Lithuanians in 1368.

Kheta. The English spelling of an Egyptian name for ancient N. Syrian peoples. Occurring from Thothmes III to Rameses III, it denotes confederacies of varying racial elements, including the cuneiform (K)hatti and the Biblical Hittites. Rameses II's treaty with a Hittite king designates him in a Karnak version Khetasar, Kheta-king. See Hittites.

Khingan Mountains. Ranges situated between Mongolia and Manchuria. They form the easternmost section of the mountainous system stretching across Asia, which here assumes a N.E. direction. The Great Khingan have a mean alt. of 5,000 ft., with peaks as high as 7,000 ft.; the system is from 80 to 100 m. wide. The Little Khingan Mts. lie to the E. of the Great Khingan range, separated from it by the Manchurian plain, and reaching to the Amur river, E. of its junction with the Sungari.

Khiva OR KHWARIZM (anc. *Chorasmia*). Town of Uzbek S.S.R., lying 470 m. W. of Tashkent. It has an industry in carpets, silk, and cotton goods. Formerly it was the capital of a khanate and Russian vassal state bounded N. by the Sea of Aral, E. by the Amu-Daria and the frontier of Bokhara, S.

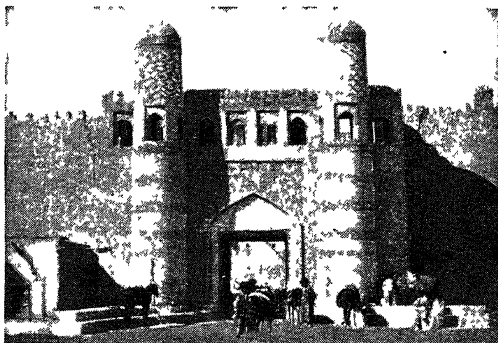
by German forces on Aug. 21, 1941, the Russian troops retiring towards Melitopol. On Dec. 20, 1943, Russian formations eliminated the bridgehead on the left bank of the Dnieper, leaving the Germans only one position E. of the lower reaches of that river.

Kherson was regained by the 3rd Ukrainian army

by the desert of Kara-Kum, and W. by the Ust-Urt plateau; area about 24,000 sq. m., mainly sandy deserts, the only fertile part being the Amu-Daria delta. Here wheat, barley, millet, rice, fruit, especially melons, are cultivated. The chief industries are pottery, silk, and textile fabrics. After having in turn formed part of the Bactrian, Persian, Turkish, and Mongol empires, Khiva maintained an independent existence from 1521 until reduced to submission by Russia in 1873. The Khan was deposed in 1919 and a Soviet set up. Khiva became part of Uzbek S.S.R. in 1924, the pop. being mostly Uzbeks. *Consul Ride to Khiva*, Burnaby, 1876.

Khmer. People of Austroasian stock in the Indo-Chinese peninsula. Numbering about 1,300,000 in Cambodia, 200,000 in Cochinchina, and 100,000 in Siam, they comprise an aboriginal Caucasian type, straight-nosed and slender, and an immigrant mongoloid type, slant-eyed and sturdy. Until the irruption of the Siamese Tai, the Mon-Khmer language prevailed throughout the peninsula. At the beginning of the Christian era the Khmers became subservient to an immigrant Hindu culture which developed a flourishing kingdom. Its greatness, from the 8th to the 14th century, is attested by magnificent stone temples, especially at Angkor-Thom. The modern Cambodians, no longer responsive to these alien influences, inhabit pile-dwellings in the river valleys and on the Tonle-Sap lake shore. See Angkor illus. p. 441.

Khnoff, FERNAND (1858-1921). Belgian painter. Born at Grembergen, E. Flanders, Sept. 12, 1858, he studied under Mellery at the Brussels academy and at Paris under Jules Lefebvre. His work is extremely individualistic, remarkable for depth of feeling, restrained colour, and severe and simple design. Among his pictures may be



Khiva, Central Asia. The Great Gate of the citadel which contains the palace of the khan

named Isolde, My Heart Weeps, The Blue Wing, Incense, The Secret, S. Anthony and the Queen of Sheba, and I Look My Door Upon Myself, the last acquired for the Munich gallery. He died Nov. 14, 1921.

Khnum. Egyptian deity. The predynastic god of the First Cataract, he was represented as a ram-headed man, bearing horizontal spiral horns derived from the hairy Nubian sheep which, by the XIIth dynasty, was displaced by the woolly Egyptian curved-horn breed. At Elephantinê he was depicted forming mankind out of clay on a potter's wheel. Temples were erected to him at Esna and other places.

Kho. People of primitive Aryan stock in the Chitral valley and adjacent country S. of the Pamirs, on the Indian and Kashmir frontier. Situated between the Gilgit Shins and the Kafirs, their non-Sanskritic Aryan speech, called Khowar, is allied to Kashmiri. They are blond, long-haired, oval-faced, and long-headed, and have abandoned their older Buddhism for a lax Sunni Mahomedanism. See Galcha.

Khoi. Town of Persia. On the Khotur Chai, a tributary of the Aras, it is situated in Azerbaijan prov., about 80 m. N.W. of Tabriz and 50 m. S.W. of Julfa. The high plateau on which it stands is fertile, and Khoi has a fair trade. It is an important road junction, though blizzards interfere with the traffic. The Russians held it for a period from 1827; Turks and Russians in turn occupied it in the First Great War.

Khojak. A pass in the Toba-Kakar mountains, on the frontier of Baluchistan and Afghanistan. It has figured largely in Indian frontier history, being on the route to Kandahar. A rly. from Quetta reaches the foot of the pass.

Khojend. A town of Tadzhik S.S.R. It stands on the left bank of the Syr-Daria, 100 m. S.E. of Tashkent on the Transcaspian railway. The chief products of the town are silk and cotton goods. It was taken by the Russians in 1866. Pop. 37,000.

Khokan or **KHOKAND.** Town of Uzbek S.S.R. It is in the old province of Ferghana, on the Narin and is a junction on the Transcaspian rly., 106 m. S.E. of Tashkent. In its bazaar a large trade is done in silk and velvet goods, cutlery, and gold and silver ornaments. Khokan was the capital of an independent khanate until annexed by Russia in 1876.

Kholm or **CHELM.** Town of Poland. Situated in the province of Lublin, 45 m. by rly. E.S.E. of the city of Lublin, it trades in grain and cattle. The town was founded in 1223. Here the Russian government suppressed the Uniate church in the 19th century. It is now the seat of a bishop of the Greek Church.

Khoms or **HOMS.** A city of Tripolitania. It is situated on the Mediterranean, about 77 m. by rly. S.E. of Tripoli, on the caravan route from that city to Misrata (*q.v.*). It was occupied by the Italians on Oct. 21, 1911.

Khond or **KANDH.** Telugu and Oriya names of a primitive tribe in central India. Mostly in Madras and Orissa provinces, they exceed 600,000. Many of them retain their animism; the plains-dwelling remainder are much hinduised. Human sacrifice was formerly practised for ensuring good crops; the victims, called meriahs, being purchased and carefully tended beforehand. The British subjugation in 1835 suppressed the practice.

Khorassan or **KHURASAN.** A large prov. of N.E. Persia. It is bounded N. by Turkmen S.S.R. and E. by Afghanistan, and consists partly of desert and partly of high-lying land, portions of which are fertile. The sheep are noted for wool. It produces grain and fruit, and its industries include the manufacture of silks, shawls, and fine carpets. Turquoises are found and are exported, as are carpets, hides, timber, and opium. The capital is Meshed. Area, about 125,000 sq. m. The word means land of the sun. Khorassan is rich in the history of Islam. In 1918-20, under British auspices, a motor road was built from Duzdap in Baluchistan to Meshed, and thence to Ashkhabad on the Transcaspian rly. See Persia.

Khorramshahr. A seaport of Persia. It was formerly known as Mohammerah. It stands on the river Karun, near its junction with the Shatt-el-Arab, and is about 25 m. S.E. of Basra. There are installations of the Anglo-Persian Oil co., and a government wireless station. Besides oil, the chief exports are dates, wool, and horses. Pop. 30,000.

Khorsabad. A village of Iraq. It is on the Choser tributary of the Tigris, 12 m. N.E. of Mosul. Upon an early Assyrian settlement, Sargon of Assyria about 712 B.C. erected a royal residence called Dur-Sharrukin, or Sargon's city. Botta's excavations, 1843-44, and Place's, 1851-55, revealed a mas-

sive palace and temple-tower within a city wall enclosing 743 acres. Many of its winged human-headed bulls, statues, and reliefs are in Paris. See Architecture; Ziggurat.

Khotan. Town and oasis in the S.W. of Sinkiang prov., China, S. of the Taklamakan Desert. The local name is Ilchi. The dist. abounds in minerals, including gold and precious stones, and is a centre of the jade industry. Watered by the Khotan-Daria affluent of the Tarim, the oasis lies on the ancient caravan route between China and the Roman Orient, and has connexion with India over the Karakoram pass. Visited by Fahien in 400 and by Marco Polo in 1274, it was explored from 1896 onwards by Hedin, Stein, and others who revealed a settled culture from the 3rd century B.C., greatly enriched by Greco-Buddhist contact. In 1913-16 Stein discovered in the vicinity early Buddhist shrines and frescoes, and priceless inscriptions on wood, besides Palaeolithic implements. Pop. 18,000. Consult Sand-buried Ruins of K., Stein, 1903; Ancient K., Stein, 1907.

Khotin. Town of the Ukraine S.S.R. Until 1940 it was part of Rumania, in Bessarabia. It stands on the Dniester, near the frontier of Poland and 20 m. S.W. of Kamenets. There are leather, shoe, and candle factories, breweries, and brickworks. Khotin, a medieval Genoese colony, has belonged in turn to Poles, Turks, and Austrians.

Khoury, BECHARA EL (b. 1891). Lebanese statesman. Son of the sheikh Khalil el Khoury, he studied law and sat as a magistrate. A member of the Lebanese parliament from 1921, he held at different periods the offices of minister of the interior and prime minister. Under the French mandate he strove for his country's independence, and when this was recognized he became president of the Lebanese republic, Sept. 21, 1943. On Nov. 11, when his government decided to pass constitutional amendments without French sanction, he and several ministers were imprisoned on the orders of the French resident. Widespread disturbances resulted, and appeals for support, backed by Egypt, were addressed to Great Britain and the U.S.A. On Nov. 21 the president and his ministers were reinstated.

Khulna. District, subdivision, and town, of Eastern Bengal, Pakistan. The district lies in the

S. of the Ganges delta. Of the total area about two-thirds is under cultivation, rice being the principal crop. The industries include the manufacture of sugar and of cotton goods. Rice is among the chief exports, the imports including piece goods, hardware, and glassware. Khulna town is on the rly. and is a trade centre. Area of dist., 4,805 sq. m. Pop., dist., 1,943,218; sub-division, 217,000; town, 18,000.

Khurja. Subdivision and town in India, in Bulandshahr district of the Uttar union. It is in the Jumna-Ganges doab, S.E. of Delhi. Cotton is extensively cultivated in the subdivision. Khurja town is a commercial and industrial centre and rly. junction, and contains cotton ginning and pressing factories. Here is a fine modern Jain temple. Area of subdiv., 457 sq. m. Pop., subdiv., 302,381; town, 31,000.

Khuzistan. An alternative name for the province of Persia better known as Arabistan (*q.v.*).

Khyber Pass. Pass through the Khyber Mts. connecting Pakistan and Afghanistan. The bed of a stream and passing between high cliffs and rocks, the defile is 33 m. in length, and in parts only 15 ft. wide. The only path by which heavy traffic and artillery can pass from one country to the other, it has always been of great military importance and the scene of struggles. The road which traverses the pass from Peshawar to Kabul was made by the British. The forts commanding it were stoutly held by the Afridis in both the Afghan Wars, 1839-42 and 1878-80, and were seized by them during the rising of 1897. A rly. from Jamrud to the Afghan frontier, 27 m., was opened in 1925. See Afghanistan; Afghan Wars.

Kiakhta. A town of Central Asia, on the frontier of Outer Mongolia and the Buriat-Mongol A.S.S.R. It lies 165 m. S.E. of Irkutsk. Kiakhta was formerly the centre of Russo-Chinese trade.

Kiang (*Asinus hemionus*). The largest species of wild ass, native of Tibet. Its coat is reddish brown on the back and face, with cream colour on the neck and under parts. It has comparatively short ears, stands about 13 hands high, and more nearly resembles the horse than any other of the asses.

Kiangsi. Chinese province, in the S.E., draining to the Yang-tse valley. Covering 66,600 sq. m., it contains 83 counties and one municipality, with Nanchang as its capital. Other important cities

include Kiukiang, Kian, and Kanhsien. Kuling, near Kiukiang, is a famous summer resort. The Chekiang-Kiangsi and the Nanchang - Kiukiang rlys. run through the province. Poyang Lake, just S. of the Yang-tse is one of the two largest lakes in the country. The principal products are rice, tea, tungsten, coal, and fine porcelain. Molybdenum is found. Pop. 13,794,159.

Kiangsu. Eastern coastal province of China. Its area is 42,085 sq. m., and it contains 61 counties and one municipality, with Chin-kiang as its capital. Other cities include Nanking, the national capital; Shanghai, one of the world's greatest seaports; Soochow, Wusih, Nantung, and Hsuehchow. One of the most highly developed provinces, it is served by the Nanking-Shanghai, Shanghai-Hangchow, Soochow-Kiashing, Tientsin-Pukow, Lunghai, and Kiangnan rlys. N. and S. of the Yang-tse there is an excellent network of canals and lakes. The principal products are rice, silk, cotton, and fish. The S. is very fertile, being the region which impressed Marco Polo (*q.v.*) by its opulence; while the N. contains silt from the Yellow River which flowed here until 1852. Tanning and match manufacture are occupations. Densely inhabited, Kiangsu has a pop. of 36,464,000.

Kianta. Lake of Finland, just N. of Suomussalmi. On Dec. 31, 1939, during the Russo-Finnish war, a Russian division was surrounded by the Finns on the frozen lake and almost completely destroyed.

Kiao-chow. Bay and territory on the coast of N. China, Shantung province. As compensation for



Kiang. Species of wild ass which is a native of Tibet
W. S. Berridge, F.Z.S.

the murder of two German missionaries the territory, 193 sq. m. in area, was leased in 1898 to Germany for 99 years, a zone 31 m. wide from all points of the territory being also constituted a German sphere of interest. Kiao-chow was opened to foreign trade

in 1899, and from 1905 the customs station passed under the control of the Chinese maritime customs. The name of the port and chief town is Tsingtao, which is connected by rly. with Tsinan. The bay entrance is $\frac{3}{4}$ m. wide.

Shortly after the outbreak of the First Great War, Japan called upon Germany to surrender Kiao-chow, and on the latter's refusal a joint Anglo-Japanese expedition assaulted Tsingtao, which surrendered Nov. 7, 1914. The territory was given back to China in 1922. In the Second Great War the Japanese invested the area, declaring it a special zone for operations. In 1946 it was retaken by the Chinese. Pop. 590,000. See China; Tsingtao, Capture of.

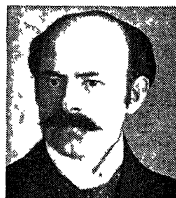
Kibble. Mining term used for the iron tubs or buckets in which excavated rock and earth is raised to the surface during shaft-sinking operations. In one form, on release of catches holding the suspension frame or handle in place, the kibble automatically turns over and discharges its contents without being detached from the rope.

Kicking Horse Pass. A pass through the Rocky Mts., Canada, discovered in 1856 by Dr. James Hector (later Sir James) while prospecting for a route for the C.P.R. which was built through it. It is on the borders of British Columbia and Alberta, near Banff and about 200 m. N. of the U.S.A. boundary. It is 5,300 ft. high.

Kidd, BENJAMIN (1858-1916). British sociologist. Born Sept. 9, 1858, he became a clerk in the inland revenue department, retiring soon after 1894, when he made a reputation with *Social Evolution*, a book translated into many European languages. He travelled all over the world studying economic conditions and then settled down to the life of a student, dying Oct. 2, 1916.

Kidd's philosophy is, briefly, that there is an essential antagonism and continuous conflict between private interest and social welfare, which rids the world of the unfit. He finds in religion the force which overcomes private interest and makes possible the progress of civilization.

These theories were expanded in *The Principles of Western Civilization*, published in 1902.

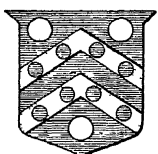


Benjamin Kidd,
British sociologist
Elliott & Fry

Kidd, WILLIAM (c. 1650–1701). Scottish pirate. Emigrating early to Boston, Mass., he commanded a privateer in the wars of William III, and in 1696 was appointed to assist in the suppression of piracy. On board the *Adventure*, he sailed to Madagascar, the home of many marauders; but soon changed his occupation from hunting pirates to being an active one himself. In 1699 he was captured on landing from a sloop at Boston, and sent to England, where he was tried at the Old Bailey. On insufficient testimony of some of his crew, who turned king's evidence, Kidd was sentenced to death and hanged, May 23, 1701. Only part of his reputed treasure was ever found. *Consult* Trial, ed. G. Brooks, 1931.

Kidderminster. Mun. borough and market town of Worcestershire, England. It stands on the Stour, 15 m. N. of Worcester and 124 m. from London, and is served by railway and by a canal. The chief buildings include the fine parish church of All Saints, partly Early English; S. George's church; and the town hall. There is a school of science and art; also a grammar school, founded by Charles I. To Richard Baxter, minister here 1641–66, there is a statue, and another to Sir Rowland Hill. The Congregational Church bears the name of the former. Brinton Park is a public open space. The chief industry is the manufacture of carpets, established about 1730. The carpets became famous owing, it is said, to the durability of the colouring obtained by using the Stour water, in which are fuller's earth and iron. Other industries include spinning and dyeing.

In existence at the time of Domesday, Kidderminster became a town in the Middle Ages, but was not incorporated as such until 1636. Cloth was manufactured here early in the 14th century, and for this the town was long famous. It is governed by a mayor and corporation. It sent a member to parliament from 1832 to 1918, and



Kidderminster arms

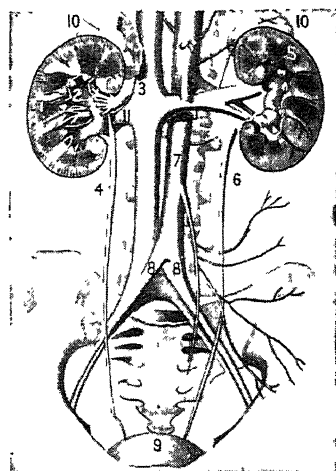
now gives its name to a county constituency. Market day, Thurs. Pop. 34,670.

Kidnapped. A romantic story by R. L. Stevenson, 1886, with the descriptive title *Kidnapped*: being *Memoirs of the Adventures of David Balfour in the Year 1751*, how he was Kidnapped and Cast Away; his Sufferings in a Desert Island; his Journey in the Wild Highlands; his Acquaintance with Alan Breck Stewart and other Notorious Highland Jacobites; with All that he suffered at the Hands of his Uncle, Ebenezer Balfour of Shaws, falsely so-called; written by Himself and now set forth. *Catriona* (*q.v.*) is a sequel.

Kidnapping. A slang term for abduction (*q.v.*). It came into use in the 17th century in England as a compound word meaning nabbing a kid, and referred to the prevalent practice of seizing children and taking them to work as slaves on American plantations. Nowadays the term is used for the forcible or fraudulent carrying away of any person and holding him to ransom. In English law it is punishable by fine or imprisonment, or, if the victim is a child, by penal servitude.

The crime is a comparatively frequent one in the U.S.A., where until 1932 it was a state, and not a federal, offence, which made it easy for perpetrators to escape. After the notorious Lindbergh case, kidnapping became a federal offence. Nevertheless, between 1932 and 1942, the federal bureau of investigation dealt with 238 cases, for which 474 persons were convicted. By 1946 the average number of kidnappings per year was 18. *See* Lindbergh Baby Case.

Kidney. Organ which abstracts waste material from the blood in the form of urine. In man the two kidneys are situated against the posterior wall of the abdomen, one on each side of the spinal column. Their average length is



Kidney. Anatomical diagram. 1. Right kidney, shown in section. 2. Pelvis of ureter. 3. Renal artery. 4. Right ureter. 5. Left kidney. 6. Left ureter. 7. Aorta. 8. Common and external iliac artery. 9. Bladder. 10. Right and left suprarenal glands. 11. Renal vein

4 ins., breadth $2\frac{1}{2}$ ins., and weight $4\frac{1}{2}$ oz. in the male, and a little less in the female.

On the internal border of the kidney is a fissure through which pass the renal artery which runs from the aorta, the renal vein which joins the inferior vena cava, and the ureter which conveys urine to the bladder. After entering the kidney, the ureter expands into the pelvis. This separates into two or three principal divisions, which again subdivide into eight or twelve smaller portions called calyces, into which the pyramids open. A longitudinal section shows that the kidney consists of two parts—the cortical substance and the medullary portion.

Both these parts are composed of a large number of minute tubes. Those in the cortex begin as little capsules which surround tufts of capillary blood-vessels called glomeruli, and are continued as convoluted tubes until they reach the medullary portion, where they become straight for a certain distance. They then turn back and again enter the cortex, becoming convoluted for a second time, and then join a straight or collecting tubule which unites with others to open on the apex of one of the pyramids.

Thus the unit of the kidney is the nephron, comprising the glomerulus, the absorbing tubules, and the collecting tubules. Under the pressure of the blood in the glomerular capillaries, the glomeruli filter a fluid similar to blood plasma but without protein. The tubules



Kidderminster, Worcs. Municipal buildings (left) and the Market Hall; the statue is of Sir Rowland Hill, the post office reformer, born here in 1795

re absorb most of this fluid into the blood stream, and the concentrated residue contains the waste products of the living animal. The kidneys have enormous reserve power against disaster due to disease or accident. The blood still clears itself of waste products (urea), but as the power of the absorbing tubules wanes, dilute urine escapes their action. With further damage less fluid is secreted by the glomeruli; the urea content rises in the blood, and the volume of urine falls. (See Bright's Disease; Uraemia.)

In floating kidney and movable kidney there is an abnormal degree of mobility of the organ, the term "floating" being applied when the kidney is freely movable in all directions, and "movable" when the range of mobility is less marked. Normally, the kidney is kept in position by the tissues and fat which surround it. Movable kidney is not necessarily accompanied by symptoms, and the condition may be discovered accidentally. In other cases there is pain in the back or groin, nausea and vomiting, irritability of the bladder, indigestion, constipation, and flatulence. In many persons there are signs of neurasthenia or hysteria. There may be attacks of severe abdominal pain, with vomiting, rise of temperature, and collapse. Where the condition is associated with debility and neurasthenia, cure can often be effected by building up the patient's constitution and relieving the nervous symptoms. The application of a belt, with properly supporting pads to keep the kidney in position, is valuable. Severe cases may necessitate an operation.

The deposition in the kidney of urinary salts, ranging in size from fine sand to concretions an inch or more across, is known as stone in the kidney. These consist of uric acid and urates, oxalate of lime, calcium phosphate, and other salts. Sand and gravel may be passed in the urine for years without causing any inconvenience, and a stone may long be present without the patient being aware of it. Often the first indication is an attack of renal colic, due to the stone being dislodged from its position and passing into the ureter. The attack comes on suddenly, and is characterized by agonising pain, passing down the side into the groin and thigh, and in the testis (in a male). Nausea and vomiting occur, the patient sweats, the temperature may rise to 103°, the pulse is feeble and quick, and collapse may follow. There may be blood in the urine,



Kidney Vetch. Foliage, flower-heads, and flower of the perennial herb

and this secretion is often diminished in amount. After a variable period the pain suddenly ceases, owing to the stone passing on into the bladder or falling back into the pelvis. Sometimes the stone becomes impacted in the ureter; this is always a serious condition, as it may ulcerate through the tissues and set up abscess formation, perhaps terminating fatally.

Treatment consists in relieving the pain by a hot bath or hot local applications. Morphia must be given hypodermically when the pain is severe, and sometimes chloroform is necessary. After recovery from the acute attack the patient should adopt the system of life and diet indicated by the chemistry of the stone. When stone in the kidney is suspected its presence can often be confirmed by an X-ray examination. In most cases it is desirable to operate and remove the stone. The capsule, the fibrous tissue enclosing the kidney, may for some reason become rather too small for it. This results in a variety of nervous symptoms, emotional imbalance, alteration in blood pressure, and frequency of micturition. Cure lies in the removal of the capsule.

The kidney plays some part in the little understood mechanism of high blood pressure. It elaborates some substance, a pressor entity, held in check by an antipressor entity elaborated by the liver. It is often possible to determine which kidney is the transgressor. The decision may be to remove it, or by the destruction of its main blood vessel to minimise the amount of pressor substance set free in the blood stream.

Other diseases of the kidney are pyelitis or inflammation of the pelvis of the kidney, tuberculosis, tumour, abscess, and cystic disease.

Kidney Ore. Variety of haematite (*q.v.*), an ore mineral of iron, occurring in reniform or

kidney-shaped masses. It has a dark colour, frequently with a metallic lustre on the mammillated surfaces; beneath this surface it usually exhibits a radiating, columnar structure.

Kidney Vetch OR **LADY'S FINGERS** (*Anthyllus vulneraria*). Perennial herb of the family Leguminosae. It is a native of Europe, W. Asia, and N. Africa. It has a woody rootstock and numerous leafy stems. The leaves are divided into pairs of slender, oblong leaflets, and the yellow flowers are clustered in a head. The calyx is covered with silky wool and the leaves with silky hairs.

Kidron OR **BROOK KIDRON**. Torrent valley between Jerusalem and the Mt. of Olives, now known as the Wady Sitti Maryam, or the valley of Jehoshaphat. Narrow and rocky, with cliffs on the E., and dry during about nine months in the year, it is mentioned several times in the O.T. (2 Sam. 15; 1 Kings 2 and 11; Jer. 31), and once in the N.T. (John 18; A.V. Cedron). Solomon's temple to Ashtoreth, Chemosh, and Molech was built here, and debris from temple and city have raised the bed level considerably. Of the Greco-Jewish rock tombs on the E. slope that known as Absalom's Pillar or Tomb of Absalom is by some identified as the tomb of Alexander Jannaeus, king of the Jews, 104-78 B.C.

Kidsgrove. Industrial town and urban district of Staffordshire, England. It is 6 m. N.W. of Stoke-on-Trent, and is on the railway and the Trent and Mersey canal. The council owns Clough Hall Park (13 acres) and the large natural Bath Pool Park (97 acres). Chief industries are light engineering, aluminium hollow-ware, and silk processing. Pop. 15,000.

Kidwelly. Mun. bor. and market town of Carmarthenshire, Wales. It stands on the Gwen-draeth, near its entrance to Carmarthen Bay, 9 m. N.W. of Llanelly, and has a railway station. The chief building is S. Mary's church, dating from the 14th century. Kidwelly has a harbour and docks, but its trade has greatly declined owing to the partial closing of the river by sand, and its chief interest now is the castle ruins. The castle, built in the 11th century, was one of the strongest in S. Wales. There are iron and tin works and collieries. Market days, Wed. and Fri. The town was first incorporated in the time of Henry VI, and is now administered by a mayor and corporation. Pop. 3,161.

Kiel. A seaport and town of Germany. It lies at the S. end of Kiel Bay, 70 m. N. of Hamburg, in Holstein. Kiel is first mentioned in the 10th century, and in the 15th century became a member of the Hanseatic League. The town passed to Denmark in 1773, and was annexed by Germany with the rest of Slesvig-Holstein in 1866. Under the imperial government it was converted into the principal arsenal and dockyard of the German navy. The fine natural harbour was dredged and laid out on modern lines, and at great shipbuilding yards some of the largest vessels were built. Krupps set up a factory for naval ordnance.

It was the mutiny of the fleet at Kiel that ultimately led to the German surrender in 1918. By the treaty of Versailles, Kiel was demilitarised; but with the resurgence of militarism under Hitler, it became again the chief German naval base. Throughout the Second Great War it was subjected to some of the heaviest raids by the R.A.F., and the dockyard and much of the town were devastated. When British forces entered in May, 1945, several ships, notably the cruiser *Hipper*, were found wrecked, while damage had been done to the immensely strong concrete U-boat pens. These dockyards were later used by the Royal Navy while destroying German equipment.

Other buildings destroyed during the war were the 16th century palace, the old town hall, the university, and all museums and galleries, though many of the contents of the latter had been removed. Among old churches wrecked was the 13th century S. Nicholas. Normally Kiel trades in coal, timber, butter, and fish,

and its industries included flour milling, printing, fish curing, and brickmaking. Pop. 213,299.

Kiel Bay. Indentation of the W. Baltic in the coast of German Slesvig-Holstein. Lying N.W. and S.E., it extends some 40 m. from Schleimünde in Angeln to the island of Fehmarn. Facing it are the Danish islands of Aerø, Langeland, and Laaland (Maribo). Kiel Harbour is the most important inlet, with Eckernförde Bay running in at the W. corner. Kiel Bay has communication with the North Sea, by the Kiel canal, as well as by way of the Great Belt round the N. coast of Denmark. The E. Baltic is reached by the Fehmarn Belt, or by the narrower sound to the south of the island.

Kiel Canal. Artificial waterway connecting the North Sea and the Baltic Sea. Schemes for cutting a canal which would avoid the passage round the Jutland peninsula were mooted in Germany as early as the 14th century, and the Hansa towns actually surveyed the proposed route, but natural difficulties were too great for their engineers. Under the German empire, however, both monetary and mechanical resources became available, and on June 3, 1887, work on the Kiel canal commenced.

Its course from the Elbe estuary is mainly N.E. to Rendsburg and then E. to Kiel Bay. Known

as a sea-level canal, it has locks near Brunsbüttel on the Elbe and at Holtenau, N. of Kiel, to compensate for the differences of tide level at the two ends. The length of the canal is just over 60 m.; as first constructed it had a depth of 29 ft. 6 ins. with a bottom width of 70 ft. and a surface width of 215 ft. Construction entailed costly dredging through shifting, marshy soil, the raising of high embankments, the erection of huge locks, and the building of road and rly. bridges. The canal, at first called the Kaiser Wilhelm canal, was officially opened by William II on June 20, 1895.

Although open to merchant shipping, the canal had been primarily designed for the benefit of German naval strategists, to enable them quickly to switch a battle fleet from the Baltic to the North Sea. With the increasing



Kiel Canal. Map of the artificial waterway joining the North and Baltic Seas

displacement of capital ships, the canal soon proved too small, and in 1909 work began on deepening the waterway to 36 ft., increasing the surface width to 331 ft. New double locks, each 1,072 ft. by 146 ft., were built at Brunsbüttel and Holtenau. The whole canal was electrically lit. These improvements added 223,000,000 marks to the total cost, making 379,000,000 marks (£19,000,000) in all.

Reopened in June, 1914, the canal was of inestimable value to Germany through the First Great War. By the Versailles Treaty the canal and its approaches were declared an international waterway for ever, to be free and navigable on equal terms to the navies and mercantile marine of every nation at peace with Germany. Tolls were to be kept as low as was consistent with covering the cost of working and maintenance.

In 1936 Hitler denounced the treaty clauses relative to the Kiel Canal, and soon the German



Kiel, Germany. Pre-war view of the old city from the west. Beyond are seen the dockyards and harbour, once the chief base of the German fleet

admiralty issued an order whereby passage through the canal would in future be granted only through diplomatic approaches. At the outbreak of the Second Great War, the Kiel Canal became a target of the R.A.F. and was heavily raided on Sept. 4, 1939, when locks and warships at Brunsbüttel were damaged. By the end of hostilities it had been virtually put out of action. British forces partially reopened the canal to traffic in June, 1945, but the work of repairing and redredging was not completed until the end of that year. The canal was again declared an international waterway.

Kielce. County of Poland. The S. is very beautiful, some parts being called the Polish Switzerland. It produces coal, in the S.W. which touches Silesia; also iron, copper, lead, zinc, and sulphur. Agriculture flourishes; and cotton fabrics, paper, sugar, bricks, glass, leather, and soap are manufactured.

Kielce. A town of Poland and capital of the co. of the same name. Standing on a tributary of the Vistula and on the rly. from Radom to Katowice, it is 90 m. N.E. of Cracow, by one of whose bishops it was founded in 1173. Its principal industries concern iron and ironmongery, and brewing, sugar, and cereals. The Russian forces took Kielce from the Austrians in the First Great War on Nov. 4, 1914, after a hand-to-hand battle in a churchyard which continued all night. In the Second Great War it was in German-occupied Poland, and was liberated by the Russians Jan. 15, 1945. It was the scene of a pogrom July 5, 1946, in which 45 Jews were killed, 40 injured; 12 ringleaders were tried, of whom nine were shot, July 16, and three condemned to ten years' imprisonment. Pop. 50,000 (850 Jews compared with 15,000 pre-war).

Kielland, ALEXANDER LANGE (1849-1906). Norwegian novelist. Born at Stavanger, Feb. 18, 1849, he studied law and managed a brickworks before becoming burgomaster in 1891. His first collection of stories, *Novelettes*, was published in 1879. This was followed by *Garman and Worse*, 1880, *Working People*, 1881, *Skipper Worse*, 1882, *Married*, 1883, *Jacob*, 1891. He also wrote plays. He is remarkable as a delineator of peasant life. A selection of his stories was published in 1891 as *Tales of Two Countries*, trans. William Archer. Kielland died April 6, 1906.

Kiepert, JOHANN SAMUEL HEINRICH (1818-99). German carto-

grapher. Born in Berlin, July 31, 1818, he was educated at its university, after which he turned his attention to geography and map-making. He was during 1845-52 director of the geographical institute at Weimar; in 1859 was made professor of geography at Berlin; and was also in the public service as head of the topographical bureau. In 1840 appeared the *Atlas of Greece*, for which he was partly responsible, and in 1848 an *Atlas of the ancient world*. In 1855 he published his *Atlas Antiquus*. His maps of Asia Minor are noteworthy, and his atlases were issued in England and other countries. He wrote a *Handbook of Ancient Geography*, 1877-78; and a *Manual of Ancient Geography*, Eng. trans. 1881. He died in Berlin, April 21, 1899.

Kierkegaard, SOREN AABYE (1813-55). A Danish philosopher. Born at Copenhagen, May 5, 1813, he was brought up in an atmosphere of rigid dogmatism. The breaking of an early engagement caused him to retire from the world and devote himself to study. He died Nov. 11, 1855. His works, most of them published under pseudonyms, laid the foundation of his philosophy in "existential" thinking, which was to reach its fullest development in the writings of Husserl and Heidegger between the Great Wars.

In Kierkegaard's philosophy truth is not something changeless and apart, but "exists for the particular individual only as he himself produces it in action." Stages of thought and complexities of personal expression are reflected in his masterpiece *Either-Or*, 1843; non-rational processes assume great importance in his teaching; aesthetic, moral, and religious problems are centred in

states of deception, guilt, and fear, as in *The Concept of Dread*, 1844. Another volume is *Stages on the Way of Life*, 1845. His attack upon Christendom, 1854-55, was trans. into English by W. Lowrie, 1946; *Works of Love*, by D. F. and L. M. Swenson, 1947. See *Existentialism*; consult *Something About Kierkegaard*, D. F. Swenson, 1945.

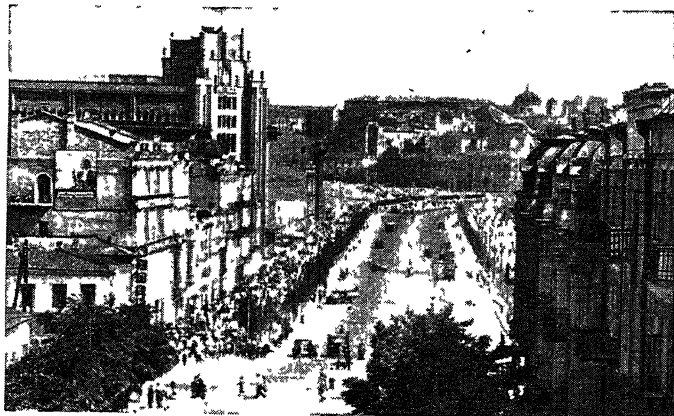
Kieselguhr. This is another name for the hydrous form of silica, diatomite (*q.v.*).

Kiesley Limestone. In geology, a subdivision of the Coniston limestones. It is of the same period as the Caradoc series of Shropshire and is found chiefly in the Lake District of England. See *Coniston Limestones*.

Kiev. The capital of the Ukraine S.S.R. and third largest city of Russia. It stands on the right bank of the Dnieper, at its junction with the Desna, 280 m. N. of Odessa, and is an important rly. junction and the headquarters of a region with the same name. It is the old residence of the grand dukes, one of the oldest cities of Russia, and the birthplace of its Christianity. A centre of the sugar beet industry and famous for preserved fruits, Kiev has considerable trade in grain, timber, and cattle. It makes machinery and has smelting and glass works, leather and tobacco factories. Podol is the old commercial quarter; Old Kiev the official and administrative centre; and Pechersk the military district. Lipki is a residential suburb. Pop. 846,293.



S. A. Kierkegaard, Danish philosopher



Kiev, Russia. The war-damaged main street, seen in 1946 during the celebration of the 29th anniversary of the Revolution



Kiev. Building of the Council of Ministers of the Ukrainian Soviet Socialist Republic

Kiev is looked upon as a holy city, the 11th century cathedral of S. Sophia and the Pecherskaya Lavra (or cave monastery) being especially venerated. The golden-domed cathedral contains five central aisles, all ending in apses and intersected by a transept, and is adorned with mosaics and frescoes; to the W. of it is the residence of the metropolitan. The monastery was founded about 1050 and raised to the rank of a first-class monastery in the 12th century. Beneath it are the caves, in which are deposited the remains of a number of saints. The university, founded at Vilna in 1588, was transferred to Kiev in 1833, under the name of the university of S. Vladimir.

"The mother of Russian cities," said to have been founded in the 5th century, became the capital of the principality of Kiev, and in the 10th century was the most important city in Russia. After being sacked by the Tartars in 1240, it was occupied by the Lithuanians and Poles, and was annexed by Russia in 1686. Its fortifications were restored during the reign of Peter the Great.

During 1914-20 it changed hands repeatedly. It was occupied by the Germans in their invasion of Russia, 1916-17. Seized by the Bolsheviks after the revolution, it was recovered by Petlura in 1919. Differences between him and Denikin led to its reoccupation by the Bolsheviks. In 1919 they were again expelled, but a month later regained and held it until its capture by the Poles, May, 1920, in their campaign against Soviet Russia. The Bolsheviks recovered it in the following month.

Bombed by the Germans from June 22, 1941, the day they in-

vaded Russia, Kiev was captured by them on Sept. 21, after the Russians had destroyed all public buildings, bridges, and power and rly. stations. On Nov. 6, 1943, the city was stormed by troops of Gen. Vatutin's 1st Ukrainian army, the Germans demolishing and setting fire to many buildings, ancient and modern, and deporting many Kiev citizens before retreating. Kiev was the last big centre of pop. between the advancing Red Army and the border of pre-war Poland.

Kikuyu. Dist. in Kenya Colony, E. Africa. The village of Kikuyu is situated 15 m. N.W. of Nairobi by rly. Sweet potatoes, maize, and millet are cultivated on the highlands around Mt. Kenya. There is a mission station (R.C.). The people are a negroid race of Bantu speech; they are mostly small-featured, prognathous, and straight-jawed. They are loosely organized in 13 totemic clans, without hereditary headmen. They use the bow, scare birds with bull-roarers, and produce fire by wood-friction.

Kikuyu Conference. Assembly of missionaries of various denominations held at Kikuyu, Kenya, in 1913. Its object was to form a federation of missions on the basis of an acceptance of the Nicene Creed, and a common form of church organization. In connexion with the meetings the bishops of Mombasa and Uganda celebrated the Eucharist, and admitted the missionaries present to communion, irrespective of their denominational position. The bishop of Zanzibar then made a public protest, and appealed to the archbishop of Canterbury.

The archbishop convened the general consultative body of the Lambeth conference to consider the matter, and in 1915 he gave his decision that the action of the two bishops was irregular and abnormal; that exchange of pulpits between Anglican and other ministers was within the discretion of the bishop of the diocese; that non-Anglicans might be admitted to communion by permission of the bishop, subject to certain conditions; and that it was unlawful for Anglicans to receive communion at the hands of ministers who had not been episcopally ordained.

Kilauea. A crater in the E. of Hawaii. On the E. slope of the noted volcano Mauna Loa, about 4,000 ft. above sea level, it is 3 m. long and 2 m. wide, and forms a constantly agitated lake of lava, the largest of all active craters. Violent eruptions occurred in 1798, 1823, 1840, and 1868.

Kilbarchan. An old town of Renfrewshire, Scotland. It lies about 5 m. W. of Paisley, and has a rly. station. It derives its name from S. Barchan, who flourished in the 6th century; the town has a medieval appearance. Famous for hand-woven tartans, it is the last remaining centre where they are procured for members of the royal family. Veterans of the loom carry on the weaving tradition. Pop. 7,510.

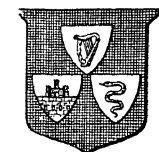
Kilburnie. Industrial town of Ayrshire, Scotland. It stands 20 m. S.W. of Glasgow, on the river Garnock, and is served by railway. Its industries include thread, net, and steel manufacture. The chief building is the 16th century parish church; there are a public hall and a recreational institute. Ruins are seen of a 13th century castle, a seat of the earl of Crawford until destroyed by fire in 1757. Kilbirnie Loch is near by. Pop. 8,193.

Kilbrennan Sound. Channel between the isle of Arran and the peninsula of Kintyre, Scotland. Length, 23 m.; breadth, 3-8 m.

Kilburn. Suburb of N.W. London. In the boroughs of Hampstead and Willesden, it has stations on the Met., Bakerloo, and suburban electric rlys. It includes the districts of West Kilburn and Kilburn Park. Part of Edgware Road is here known as Kilburn High Road. Near Belsize Road, on a spot adjoining the site of an Augustinian priory, which stood from 1376 to 1536, there was in the 18th century a spring, Kilburn Wells, the tea gardens attached to which existed from 1773 to 1829. They adjoined the Old Bell tavern, which dated from 1600, and was rebuilt about 1863.

Kilchurn Castle. Ruined castle of Argyllshire, Scotland. It stands on a small island at the N.E. end of Loch Awe, 2½ m. W. of Dalmally. Dating from the middle of the 15th century, the castle was long a stronghold of the Campbells, but was abandoned about 1750. Pron. Kil-hoorn. See Awe, Loch.

Kildare. County of Eire. In the province of Leinster, its area is 654 sq. m. It is the most level of all Irish counties. A large area in the N. is included in the Bog of



Kildare county arms

Allen, though in this region there is some higher land where farming is carried on. In the centre is the undulating plain of the

Curragh, with a permanent military camp, also noted for horses. Kildare is drained by the Liffey, Boyne, and Barrow. The Eire State rlys. and the Grand and Royal canals cross the co. Kildare, the co. town, Athy, Maynooth, Naas, and Newbridge are the chief places. The co. joins with Carlow to send four members to the Dáil. Pop. 64,559.

Kildare. Market town and co. town of Kildare, Eire. It is 30 m. S.W. of Dublin with a junction on the Eire State rlys. The chief building is the cathedral erected in the 13th century; it was restored in the 19th, although the see had been united with Dublin. A round tower, in good condition, still stands, 108 ft. high. The cathedral is on the site of Cill-Dara (church of the oak), built under an oak tree in the 5th century by S. Brigid. Market day, Thurs. Pop. 2,106.

Kildare, EARL OF. Irish title borne from 1316 by the family of Fitzgerald (*q.v.*). John Fitz-

killed by rebels in 1597, the earl-dom passing to a cousin from whom it descended to James (1722-73), the 20th earl. He was made viscount 1747, marquess of Kildare 1761, and duke of Leinster 1766. A study of the Great Earl by D. Bryan appeared in 1933.

Kilia. A town of Bessarabia, and since 1940 part of Moldavia A.S.S.R. It stands on the N. (Kilia) distributary of the Danube, 12 m. from its mouth, and 100 m. S.W. of Odessa. It was incorporated with Russia by the Berlin treaty, 1878. Between the Great Wars it belonged to Rumania.

Kilima-Njaro OR KILIMANDJARO. Isolated mountain mass in the N. of Tanganyika Territory, consisting of two extinct volcanic peaks, connected by a broad and massive ridge. The highest point is 19,325 ft. alt., and the crater is about 650 ft. in depth. The mountain is clad with a forest belt, 5 m. to 7 m. wide, 6,000 ft. to 10,000 ft. in height, and the summits are covered with glaciers and snow.

The surrounding country is exceedingly fertile, and highly cultivated. Kilima-Njaro was first seen by the missionaries Rebmann and Krapf in 1847. The district was explored by Sir Harry Johnston in 1884, and by Dr. Meyer in 1889. It was prominent in the British campaign against the Germans, 1916.

Consult The Kilimanjaro Expedition, Sir H. Johnston, 1886; The Germans and Africa, P. E. Lewin, 1915.

Kilindini. Harbour of Kenya Colony. Forming part of the port of Mombasa, it lies to the S.W. of Mombasa I. and is the finest land-locked and most sheltered harbour on the E. coast of Africa. It has seven deep water berths, a bulk oil jetty, and a lighterage berth.

Kilkeel. Village and watering-place of Clare, Eire. It stands on Moore Bay, 8 m. W.N.W. of Kilrush, and has a rly. station. Irish moss is collected here, and there is some fishing. Pop. 1,700.

Kilkenny. County of Eire. In the prov. of Leinster, its area is 796 sq. m. It has a generally level surface, but rises in the N.E. to upwards of 1,000 ft. The E.

boundary is traced partly by the river Barrow; the middle is traversed by the Nore, and the Suir marks the S. limit. Kilkenny is essentially agricultural and largely used for the pasturage of sheep and cattle. Coal is mined in the Castlecomer dist. and black marble is quarried near the co. town of Kilkenny; flour, whisky, and beer are manufactures. The Eire State rlys. serve the county. Kilkenny, Callan, Castlecomer, and Thomastown are the principal towns. The many antiquities include stone circles, hill forts, cromlechs, round towers, and abbey and castle ruins. Three members are sent to the Dáil. Pop. 68,006.

Kilkenny. City, market town, and co. town of Kilkenny, Eire. It stands on the Nore, 81 m. by rly. S.W. of Dublin.

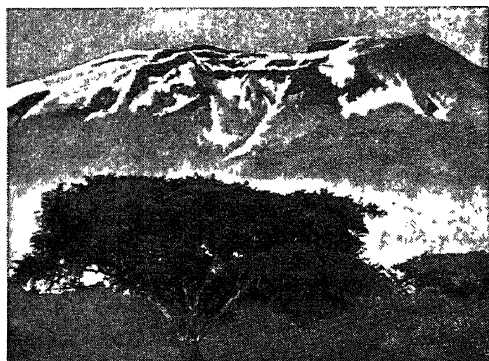
The chief buildings are the cathedral of S. Canice (after S. Patrick's, Dublin, the largest in the country), and the castle, the successor of one built by Strongbow. The cathedral, dating mainly from the 13th century, was restored in the 19th century; in E.E. style, it is built of black marble and is rich in memorials of the past. The castle is the seat of the marquess of Ormonde. Other buildings are Kilkenny school, at which Swift and Berkeley were educated; the tholsel, or city court; and the bishop's palace. There are remains of two monasteries and a round tower.

A tributary of the Nore, the Bregen, divides the town into an Irish and an English part, and the saying about the Kilkenny cats is said to have originated in feuds between the two. The R.C.s have a college near the city. The chief industries are marble works, tanneries, and corn mills. The town was named after S. Canice. It is the seat of the bishop of Ossory. It became a borough soon after the English conquest of Ireland, Irish-town remaining separate, but the two parts were united about 1600. Several parliaments were held here, and until 1800 the city sent two members to the Irish parliament. It is now administered by a mayor and corporation. Market day, Sat. Pop. 10,289.

Kilkenny, STATUTE OF. Measure establishing the English Pale in Ireland, passed in 1366 by a parliament which met at Kilkenny during the lord lieutenantcy of Lionel, duke of Clarence, second



Kilkenny town arms



Kilima-Njaro. View of the extinct volcanic peaks in Tanganyika Territory

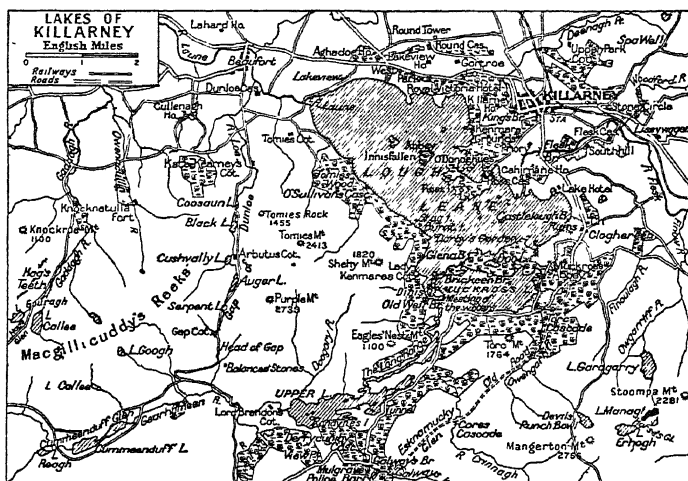
Thomas, who inherited the Ophaley lands from his grandfather, Maurice Fitzgerald, chief justiciar of Ireland, was created earl of Kildare in 1316. The title descended in the direct line to Gerald, 8th earl, called the Great, deputy governor of Ireland from 1481 until his death in 1513. Silken Thomas, 10th earl, in revenge for the treatment received by his father, who was lord deputy, led a rebellion in 1534 against Henry VIII, besieging Dublin Castle and laying waste large areas in Meath and Kildare. Defeated in 1535, he surrendered and was executed at Tyburn, Feb. 3, 1537. The family was attainted, but Thomas's half-brother, Gerald, received back his estates in 1552, and was created earl of Kildare in 1554. His son, Henry of the Battleaxes, was

son of Edward III. Within the Pale (*q.v.*) English law was established. The statute also forbade, under the penalties of high treason, any of the English race to intermarry with the Irish, or to adopt an Irish name, dress, language, or customs. Outside the Pale the statute was virtually a dead letter.

Killaloe. City and market town of Clare, Eire. It stands on the Shannon, 17 m. N.E. of Limerick. There is a station at Ballina, Tipperary, on the opposite side of the river, here crossed by a bridge with 13 arches. The chief building is the cathedral of S. Flannan, a 12th century edifice. Killaloe has both a Roman Catholic and a Protestant bishop. It is a centre for fishing in the Shannon. Founded in the 6th century or earlier, when a church was built here, Killaloe was the capital of the O'Briens, kings of Munster, whose palace was at Kincora, near the town. The Shannon here flows through a noted gorge, which dams its waters to form Lough Derg. Pop. 821.

Killarney (Celt. *Cill Arne*, church of the sloes). Urban dist. and town of Kerry, Eire. It is 46 m. W. by N. of Cork by rly. The parish church of S. Mary (Protestant) was built in 1868. The beautiful R.C. cathedral of S. Mary, 1846-56, of white limestone, is by Pugin in Early English style. The Protestant Episcopal church has a notable white spire.

The earl of Kenmare's seat, Killarney House, in the Elizabethan style, 1875-81, was badly damaged by fire in 1913. Other buildings are the bishop's palace; diocesan seminary of S. Brendan; Presentation Convent, with school of lace and needlework; Castle-rosse School of Industry, where wood-carving and domestic economy are taught; Convent of the Sisters of Mercy; Ballydowney, the reputed birthplace of Robert



Killarney. Map of the famous lakes and their picturesque surroundings

Emmet (*q.v.*); town hall, 1860. Market day, Sat. Pop. 5,943.

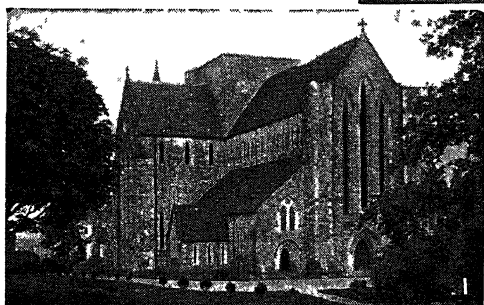
Killarney, LAKES OF. Three lakes of Kerry, Eire, lying W. and S. of the town of the same name. The largest, Lower Lake, or Lough Leane, 4 m. long, covers 5,000

of Ross Castle, a 14th century stronghold of O'Donoghue Ross, who, from the City of Perpetual Youth beneath the lake, is said every 7th year to revisit his old home. Here Tennyson wrote part of *The Princess*. On Innisfallen

Island are monastic ruins enshrining the memory of S. Finan Lothar, or the Leper. Innisfallen is mentioned by Bede, and in the 7th century was a famous centre of learning. On the peninsula between Lower Lake and Muckross

Lake are the remains of Muckross Abbey, or Abbey of Irrelagh, founded by Donal MacCarthy More for the Franciscan order in 1340, and destroyed by Ludlow in 1652. Most of the lake islands are thickly studded with arbutus trees, whose colour adds greatly to their natural beauty.

Killarney lakes are fed by the river Flesk and discharge their waters from the Lower Lake by the Laune, which flows N.W. to Castlemain harbour. In the neighbourhood are Flesk, Castle, Aghadoe House, Macgillicuddy's Reeks, Purple Mt., Eagle's Nest Mt., Torc Mt., with a cascade, and Mangeron Mt., with a deep depression known as the Devil's Punch Bowl, Dunloe Castle, Ogham Cave, the celebrated Gap of Dunloe, and Tiernaboul, once a fortress of the MacSweeneys. The new road from Kenmare to Killarney, by way of Windy Gap, affords a series of lovely views of the lakes from the



Killarney, co. Kerry. 1. Roman Catholic Cathedral of S. Mary, designed by Pugin. 2. Ancient abbey of Muckross. 3. Ruins of Ross Castle in Lough Leane

channel 2½ m. long, which, at the Old Weir Bridge, ends in the rapids known as the Meeting of the Waters.

The lakes lie in a basin, backed W., S., and S.E. by lofty mts. and wildly picturesque ravines, and are studded with thickly wooded islands. On Ross Island, in Lough Leane, is the keep

E.; as do vantage points in the park of 10,000 acres presented to the nation by the owners in 1932.

Killas. Term, first used by Cornish miners, denoting the sedimentary rock formations in Cornwall. These are frequently clay slates which have been metamorphosed to various degrees by intrusive tin-bearing granites. The mineral veins which occur in the killas are those of tin-copper, copper, lead-zinc, and iron.

Killiecrankie. Pass of Perthshire, Scotland. The Killiecrankie railway station is 4 m. N.W.



Killiecrankie. View looking up the famous Perthshire pass, scene of a Highland victory over the English, 1689

of Pitlochry. The pass stretches for about 1½ m. from there to Garry Bridge, and the river Garry flows through it. It is traversed by the rly. and the A9 road, and is beautifully wooded.

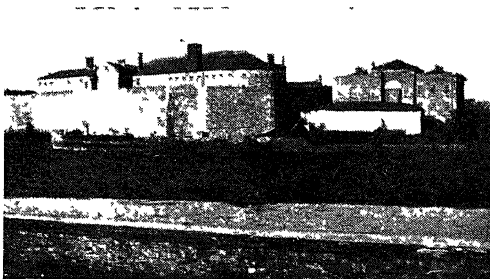
The plain at the N. of the pass was the scene of the encounter in which on July 27, 1689, Graham of Claverhouse, Viscount Dundee, at the head of some Highlanders, routed a force sent by William III to subdue the Scottish Jacobites. The force under Mackay, about 4,000 strong, reached the head of the pass, to find the Highlanders ready for them. An impetuous charge threw them into disorder, and they were soon in flight. Mackay lost over a thousand men; the losses of the Jacobites were also heavy, including Dundee.

Killigrew, THOMAS (1612-83). English dramatist. Born in Lothbury, London, Feb. 7, 1612, his father being the courtier Sir Robert Killigrew, in 1633 he was appointed page to Charles I. Before the Civil War he had produced

three plays. He took the Royalist side and went abroad with the exiled court, acting for some time as resident at Venice. At the Restoration he was made groom of the bedchamber. In 1663 he built a theatre for the company of the king's actors where Drury Lane Theatre now stands, and in 1673 he was appointed master of the revels. He died March 19, 1683, and was buried in Westminster Abbey. A study by A. Harbage appeared in 1930.

Killin. Village of Perthshire, Scotland. At the S.W. extremity of Loch Tay, where the Lochay and Dochart meet, it has a railway station on a branch line from Killin Junction. It is known for a stone supposed to mark Fingal's grave, and for the burial place of the Macnab clan. Pop. 1,414.

Killinger, MANFRED, BARON VON (1886-1944). A German administrator. Born July 14, 1886, at Lindigt, Saxony, he entered the



navy, and commanded U-boats in the First Great War. Joining secret military organizations, he was involved in the assassination of Erzberger, 1921; he joined the Nazi party, was elected to the Saxon diet



Thomas Killigrew,
English dramatist
British Museum

1928, to the Reichstag 1932, and led the Brownshirts in Central Germany. The prime minister of Saxony, 1933-34, he was consul-general in San Francisco, 1937, then from Dec. 21, 1940, minister at Bukarest and the real ruler of Rumania, dominating Gen. Antonescu by promises, bullying, and taking him to conferences with Hitler and Ribbentrop. When the Russians took Bukarest, Killinger committed suicide, Sept. 4, 1944.

Killingworth. Village of Northumberland, England, 6 m. N.E. of Newcastle-on-Tyne, on the railway. It was the place where Stephenson built in 1814 his first locomotive. A coal mining centre, it has a pop. of 2,283.

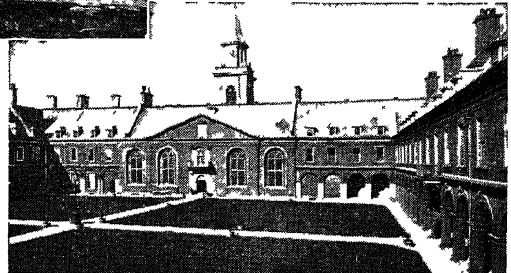
Killybegs. Seaport of county Donegal, Eire. It stands on a bay, 19 m. W. of Donegal, and has a rly. station. It is a fishing centre, salmon and herring being caught, and has a technical school for teaching fish-curing. Pop. 634.

Killyleagh. Town and seaport of Down, N. Ireland. It stands on Strangford Lough, 4 m. E. of Crossgar, and has manufactures of linen and a chrome tanning industry. Pop. 1,600.

Kilmaccolm OR **KILMALCOLM.** A village of Renfrewshire, Scotland. It stands on Gryfe Water, 8 m. S.E. of Greenock, and has a railway station. A popular health resort, it has a hydropathic establishment, golf links, and a public park. Pop. 3,500.

Kilmainham Hospital. Establishment near Dublin. It was founded in 1675 on behalf of Charles II by the earl of Granard, when he commanded the forces in Ireland, for the relief of veteran soldiers. It was built by Wren, the plans having been completed in 1679. The management of the hospital has been vested since 1940 in the Dublin Hospitals Bureau.

Kilmainham Prison. Gaol in Kilmainham, memorable as the place where Parnell and other



Kilmainham Hospital. The quadrangle of the Military Hospital, near Dublin, founded in 1675. Top left, Kilmainham Prison. Containing over 100 cells, it housed Parnell and other "subjects" of the Land League

protagonists of the Land League were incarcerated. It was originally the county of Dublin gaol for males and females, and is now used as a local prison for the city and neighbourhood. The more recent portion dates from about the middle of the 19th century, and has a fine central hall with upwards of 100 cells; the old portion was formerly used for women only, but has been adapted to house both sexes.

Kilmainham Treaty. Name given to an informal arrangement made in April, 1882, between W. E. Gladstone's government and the Irish leader, C. S. Parnell. Parnell, held in Kilmainham Prison, got into communication with Joseph Chamberlain, and promised on conditions to assist the authorities in bringing Ireland to order. In return he and his imprisoned colleagues were to be released. In a letter Parnell stated that he believed the influence he could exert would put an end to boycotting and outrages generally, and promised to work with the Liberal party in future. He and others were then released. The result was the resignation of the Irish secretary, W. E. Forster, and the sequel the Phoenix Park murders (*q.v.*). This ended the so-called treaty, in which the chief intermediary was Captain O'Shea. See Home Rule; Land League.

Kilmallock. Market town of Limerick, Eire. It is 21 m. S. of Limerick, on the Eire State rlys. A stronghold of the earls of Desmond, it was a fortified place in the 17th century and earlier, and was destroyed by the earl of Ormonde. A Dominican abbey was founded about 1291; there are some remains of this, and of the fortifications. Kilmallock was made a borough by Queen Elizabeth. The centre of a rich agricultural district, it holds a weekly livestock fair from January to May, and an annual horse fair opening June 20. A fowl market is held on Fridays. Pop. 1,100.

Kilmarnock. Mun. and police burgh and market town of Ayrshire, Scotland. It stands on Kilmarnock Water, near its junction with the Irvine, 22½ m. S.S.W. of Glasgow, and has a railway station. The principal buildings are the Dick Institute, with library, museum, and art gallery; and the Sheriff court house. In Kay Park is a memorial to Burns: this contains a museum, in which are the MSS. of some of his poems.

Besides being a marketing centre the burgh makes bridges, cranes,

boilers, locomotives, footwear, porcelain, lace and hosiery, carpets, whisky, and margarine. Coal is mined near. In the 16th century the town was famous for the manufacture of the woollen bonnets and cowls named after it. The neighbourhood is noted for its fine dairy herds and horses.

On the land of the Boyds, one of whom was created earl of Kilmarnock, the place was made a burgh of barony in 1591. Their castle was burned down in 1735. The barony has been held since 1831 as a courtesy title of the earls of Erroll (*q.v.*). Market day, Fri. Pop. est. 41,100.

Kilmarnock, EARL OF. Scottish title borne by the family of Boyd from 1661 to 1746. William Boyd, the representative of an old and noted Scottish family, long settled in Ayrshire, inherited the title of Lord Boyd. Having served the royalist cause, he was made earl of Kilmarnock in 1661. William, the 3rd earl, was on the side of George I during the Jacobite rising of 1715, but his son William, the 4th earl, espoused the cause of the exiled Stuarts. Joining the Young Pretender in 1745, he fought at Falkirk and was taken prisoner at Culloden, and was executed with Lord Balmerino on Tower Hill, Aug. 18, 1746, and buried in the chapel of S. Peter ad Vincula in the Tower.

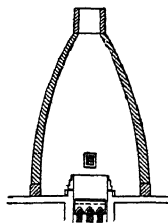
Kiln (A.S. *cŷln*, Lat. *culina*, kitchen). A structure of brick, stone, or metal, for drying, hardening, baking, or "burning" various substances. Familiar examples are the kilns used in brewing and in the making of bricks and pottery; and those for lime burning, *i.e.* for converting limestone into quicklime—sometimes constructed from the limestone itself, surrounded by a wall of earth. A kiln differs from an oven mainly in size and shape and from a furnace mainly in its capacity for enduring the extremely high temperatures necessary for smelting.

In certain types of kiln, however, sufficient heat is generated to cause vitrification—*e.g.* a

partial fusion of the silica in the clay, producing glazed earthenware. When this occurs the kiln is said to burn; at lower temperatures it dries or bakes. Kilns show considerable variation in size and shape, but may be broadly classed as vertical or horizontal, rounded or rectangular; and there are two predominant types—the intermittent and the continuous. Intermittent kilns are those which, consisting of a single chamber, remain idle between the batches of material being hardened or baked; whereas the continuous kiln comprises several chambers, which can be filled or emptied independently.

The simplest form of kiln, the "Scotch," is rectangular, its side walls penetrated with fire-holes, its end walls with doorways. A similar kiln, the "Newcastle," has arched furnaces in its end walls. Both kilns are open at the top, but portable coverings are sometimes used. Flues terminating in short chimneys are connected to the fires, which are fed with coal. A cupola kiln, much used in the Staffordshire potteries, is shaped

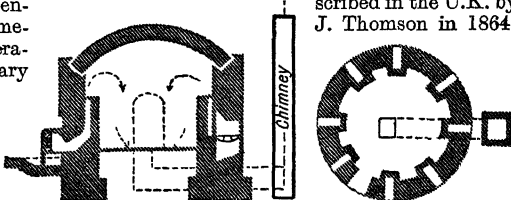
somewhat like a champagne bottle. In effect, it is a rounded, tapering wall acting as a chimney to the fires within it, which are placed within a central rectangular structure, enclosing the stack of



Kiln. Section of cupola kiln

matter to be burned. Down-draught kilns have their fireplaces within the walls of the kiln, and the flames and heated gases, passing into the kiln, are beaten back by its domed roof, and driven down to the floor, in which there is a central well leading to a chimney flue built alongside the kiln, or in some instances running up inside it.

Continuous kilns were invented by Hoffmann and were first described in the U.K. by J. Thomson in 1864.

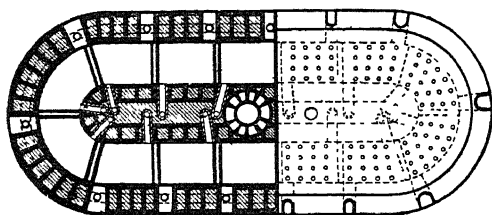


Kiln. Section and plan of down-draught kiln. The arrows show how the flames and heated gases are driven to the floor of the kiln from the fireplaces in the circular walls

This kiln, of which there are several modifications, circulates heat all through the interior, exhausting its value before allowing it to escape, whereas with the single-chamber type of kiln most of the heat makes a direct exit, and its value is wasted in the air. Consequently the continuous kiln gets twice or thrice the amount of

sands of volts, it has become the practice to use the term kilovolt (kV) for one thousand volts. Thus the usual voltage in the British grid transmission scheme is often referred to as 132 kV.

Kilowatt. In electricity, a unit of power equal to 1,000 watts or 1.34 horse power. The Board of Trade unit of energy is the kilowatt-hour, the work done when a power of 1 kW is maintained for one hour. It is therefore equal to 36×10^{12} erg.



Kiln. Sketch plan (bottom and top) of Hoffman continuous kiln, showing how heat is circulated throughout the interior

value from equal fuel consumption. At first circular in shape, continuous kilns are now more commonly oval.

Gas instead of coal is employed as the heating medium in several patent kilns. A so-called kiln of different type is the revolving cylinder for calcining cement. See Brewing; Furnace; Pottery, etc.

Kilocycle. The measure of the frequency of generation of waves. One kilocycle per second is equal to 1,000 cycles per second. Radio frequencies are of the order of 1,000 kcs. per second.

Kilogramme OR KILOGRAM (Gr. *khlion*, thousand). A measure of mass or weight in the metric system. It contains 1,000 grammes, and its equivalent in English measure is 2.2046 lb. Its usual symbol is kg. See Metric System.

Kilohertz. Electrical term. The hertz is the unit of electrical frequency used in radio engineering, and equals one cycle per second. A kilohertz therefore equals one thousand cycles per second, or one kilocycle. The latter term is more generally used in Great Britain and the U.S.A.

Kilometre. Measure of length in the metric system. It is 1,000 metres, and its equivalent in English measure is 0.6214 of a mile, or approximately 5 furlongs, i.e. 1,100 yds. The square kilometre, the unit of area used in the measurement of provinces and countries, equals 0.3862 sq. m. or 247 acres, approximately 25.64ths of a sq. m. Whence a density of population of 320 per sq. m. equals 125 per sq. km. See Metre; Metric System.

Kilovolt. Electrical term. With the increasing use of high voltages for electrical transmission often running into hundreds of thou-

m. N.W. of Glasgow and 5 m. S.E. of Dumbarton, and is served by two main railway lines. This is traditionally the birthplace of S. Patrick, hence the name, and was at one time a burgh. New or E. Kilpatrick is virtually a residential suburb of Glasgow; it has its own railway station. It includes Bearsden and is sometimes known by that name. The Kilpatrick hills are a range in Dumbartonshire and Stirlingshire, extending for about 6 m. from E. to W.; they have peaks over 1,300 ft. high. There are several places of this name in Ireland.

Kilrush. Urban dist. and harbour of Clare, Eire. It is on the N. shore of the Shannon estuary, 27 m. S.W. of Ennis by rly. It has a small but secure harbour, exports peat and fuel, and conducts a thriving fishing industry; there are slate quarries in the neighbourhood. A short rly. connects it with Kilkee, and during the summer steamers connect with the rly. terminus at Foynes. Market days, Wed. and Sat. Pop. 3,348.

Kilsyth. A police burgh of Stirlingshire, Scotland. It stands on the right bank of the Kelvin, near the Forth and Clyde Canal, 13 m. N.E. of Glasgow on the railway. Cotton is manufactured, and in the neighbourhood are limestone and sandstone quarries and iron and coal mines. Here remarkable religious revivals occurred in 1742 and 1839. The first potatoes in Scotland were planted here. The Kilsyth Hills and a ruined castle are N. of the town. The burgh supplies water and gas. In 1921 it voted for the abolition of liquor licences. Pop. 8,995.

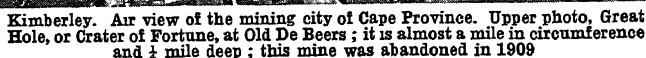
The battle of Kilsyth was fought Aug. 15, 1645, between the forces

of Montrose and those of the Covenanters under William Baillie. Hurring S., Montrose took up a position here in order to prevent the junction of the enemy force under Baillie, which had followed him despite its defeat at Alford, with another one under the earl of Lanark coming from the W. The Covenanters, without waiting for Lanark, decided to attack, and began a flank march across the front of their foes. Taking advantage of this, the Highlanders dashed at them, and soon their army of 7,000 men was destroyed. This, his sixth and last, victory made Montrose for one month dominant in Scotland.

Kilt. Short pleated skirt or petticoat reaching from the waist to the knees. It is one of the oldest forms of male costume and was worn by Assyrian and Roman soldiers. It is principally known today as the national male dress of the Highlands of Scotland, though it is no longer much worn except on formal occasions, and by Highland regiments when in full dress uniform. Originally, the Highland kilt and plaid consisted of a single piece of tartan cloth, 4 yds. long and 2 yds. wide. It was drawn in at the waist by a belt, which secured the careful folds or pleats of the lower part or skirt. The upper portion, or plaid, was fastened with a brooch or buckle over the left shoulder, leaving the right arm free for holding and using a weapon. This combined kilt and plaid was called in Gaelic fìlìbeg, a name given incorrectly to the kilt, which is a separate garment.

The cloth from which kilts are made is woven in various checked and coloured patterns called tartan (*q.v.*), signifying the wearer's clan, district, or regiment. Kilts woven from saffron or green cloth form part of the old national dress of Ireland; they are worn by pipers in the bands of certain Irish regiments. Short, white, linen kilts, called fustanella, are worn as part of national costume in mountain districts of the Balkans, and form part of the uniform of the Evzones (*q.v.*) of Greece.

Kilwa Kisiwani. Seaport of Tanganyika Territory, about 140 m. S. of Dar-es-Salaam. Formerly known by its Portuguese name of Quiloa, it was founded, on an island in Kilwa Bay, by Persians in the 10th century, and contains many interesting ruins. The new town, Kilwa Kivinje, on the mainland to N., is the terminus of a road to Lake Nyasa.

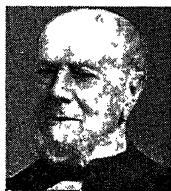


formerly a separate municipality, was united with Kimberley in 1912. European pop. 18,915. *See* Diamond.

Kimberley, SIEGE OF. Operation during the S. African War. As soon as the war began, the Boers, on Oct. 14, 1899, swarmed round the town, which was defended by about 4,000 men, regulars of the Loyal N. Lancashire Regiment, Kimberley Regt., Cape Mounted Police, and Kimberley Light Horse. Col. Kekewich was in command and Cecil Rhodes was in the town, which was well protected by a ring of forts. On Nov. 7 the bombardment began. On Nov. 25 a Boer redoubt was stormed, but an attempt three days later was a failure. Provisions soon ran short, and after the check to Lord Methuen's relieving force the position became serious, the more so because civilian and military authorities were at variance.

The Boers fired great shells into the town, and there was some desultory skirmishing outside. On Feb. 15, 1900, Gen. French with a cavalry division reached the town, and the siege was at an end. The British loss during the investment, which lasted 124 days, was 181 officers and men killed and wounded, in addition to some civilian casualties. The defenders had turned the heaps of tailings into forts, improvised a conning tower with searchlights, and themselves built a 4-1-in. gun, able to fire long distances, which did excellent service. *See* South African War.

Kimberley, JOHN WODEHOUSE, 1ST EARL OF (1826-1902). British politician. Born Jan. 7, 1826, at Wymondham, Norfolk, he was the grandson of Baron Wodehouse, of a family long settled in Norfolk, although the barony dates only from 1797. Educated at Eton and Christ Church, Ox-



1st Earl of Kimberley,
British politician
Elhott & Fry

ford, he succeeded to his grandfather's title in 1846, and sat among the Liberals in the house of lords. During 1852-56 he was under-secretary for foreign affairs, and again 1859-61. In 1864, having been on special missions to St. Petersburg and Copenhagen, he was made under-secretary for India and then lord-lieutenant of Ireland. In 1866 the ministry resigned and he was made earl of Kimberley,

taking his name from his Norfolk seat.

In 1868 the earl joined Gladstone's cabinet as lord privy seal, and during 1870-74 was colonial secretary. In 1880 he was again colonial secretary, and in 1882-86 secretary for India. He returned to the India office in 1892, and in 1894, when Lord Rosebery became prime minister, he succeeded him as foreign secretary, leaving office finally in 1895. Leader of the liberals in the lords, he died April 8, 1902. Kimberley in S. Africa was named after him, and his interest in education was recognized by his election as chancellor of the university of London. John (b. 1924) succeeded as 4th earl, 1941.

Kimbolton. Parish and town of Huntingdonshire, England. It is 10 m. W.S.W. of Huntingdon, with a rly station (E. region). The Kym, a tributary of the Ouse, flows by it. The restored church of S. Andrew has memorials of the earls and dukes of Manchester. There are an old grammar (now direct grant) school and some almshouses. A fair is held in the High St. in mid-Sept. Kimbolton Castle, partly rebuilt by Vanbrugh, is a rectangular building standing in a large park. It is the seat of the duke of Manchester, and in the castle which it replaced Catherine of Aragon lived after her divorce. Pop. 699.

Kimmel, HUSBAND EDWARD (b. 1882). American naval officer. Born at Henderson, Ky., Feb. 26, 1882, he entered the navy after graduating at Central university, being commissioned ensign in 1906. He was aide to F. D. Roosevelt when the latter was assistant secretary for the navy in 1915. He was promoted rear-admiral, 1937, and in Feb., 1941, admiral on his appointment as c.-in-c., U.S. fleet as well as of the U.S. Pacific fleet. The navy secretary, Col. Knox, blamed Kimmel for "not being on the alert" on the occasion of the Pearl Harbour disaster, and within 48 hours he was relieved of his command. The report of a congressional inquiry in 1946 found him guilty of errors of judgement, but not of dereliction of duty. *See* Pearl Harbour.

Kimmeridgian. In geology, a subdivision of the Jurassic system, a member of the upper Oolite series. It is also called Kimmeridge Clay from the hamlet in Dorset, England. A dark bluish bituminous clay, it often contains nodules of cement stones, and is found extensively in Dorset, Yorkshire, and in Lincolnshire, where it is notable

for the large calcareous masses known as doggers.

Kimmeridge clay is used in the making of bricks, tiles, etc., and that found in the Isle of Purbeck contains a considerable quantity of oil shales. Kimmeridge coal is a bituminous shale used as a fuel. Kimmeridgian is rich in fossil remains, e.g. those of ichthyosaurs, dinosaurs, and plesiosaurs, and a large number of ammonites.

Kimono. Loose robe worn by Japanese. The sleeves are cut in one piece with the rest of the gown, which is embroidered with characteristic designs. Decorative and comfortable, the kimono has become popular in Europe as a dressing-gown. *See* Dancing; Geisha; Japan.



Kimono. Japanese woman wearing this form of robe

Kimpolung OR CAMPU LUNG. Town of Wallachia, Rumania. It is in Bucegi

dept., and is near the Carpathians, on a branch rly. line to Pitesti. The ancient capital of Wallachia and a modern health resort, it has a 13th cent. cathedral, monastery, and many churches. Near by are Roman remains. Pop. 10,124.

Another Kimpolung, in Bukovina, was taken by the Russians from the Austrians on Jan. 6, 1915, but was later evacuated.

Kin. Word used for persons who are related by blood. In English law, next-of-kin is the nearest blood relation of a deceased person. The method is to count one degree for each link in the chain, which starts from the deceased person. Thus, father and mother, and all children, are in the first, while grandparents and grandchildren, brothers and sisters, are in the second degree of kin.

The expression next-of-kin is used legally to mean those most nearly related to a person by blood. In a will, however, the expression may be read to mean the persons entitled to succeed on an intestacy under the Administration of Estates Act, 1925, and so may include the husband (or wife) of the deceased, who of course is not a blood relation. *See* Family; Inheritance; Primogeniture.

Kinabalu. The highest mt. in British N. Borneo. Near the N. coast, it attains an alt. of 13,249 ft.

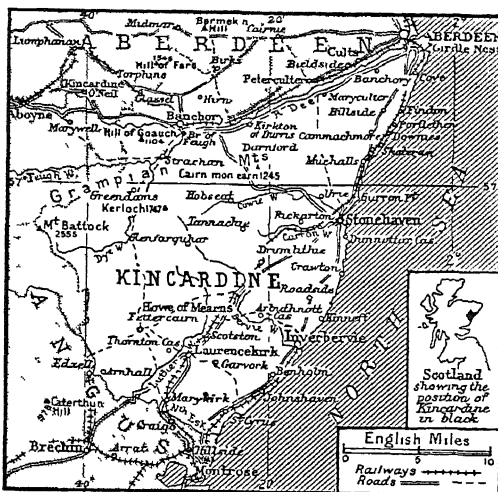
Kinburn. Old fortress in the Ukraine S.S.R. It is on the W. point of the strip of land separating the lagoon of the Dnieper from the Black Sea. Originally built by the Turks, it passed to Russia in 1774 and was abandoned as a fortress in 1860. It is now an unimportant fishing village.

The capture of the Russian fortifications during the Crimean War first demonstrated the value of armour in naval warfare. The defences, a series of powerful works mounting 80 guns and 20 mortars, were attacked by a strong Anglo-French fleet under Admirals Lyons and Bruat, Oct. 17, 1855. The fleet consisted almost entirely of wooden steamships, but the French contingent included three armoured floating batteries, built from designs prepared by Napoleon III. These vessels, protected by $4\frac{1}{2}$ ins. of iron plating on 17 ins. of wood backing, steamed in and anchored within 850 yds. of the Russian works, while the wooden ships kept farther out.

The floating batteries were armed with 18 50-pounder guns apiece, and wrought tremendous havoc among the forts. The Russians concentrated almost the whole of their fire on these ships, the wooden vessels not sustaining a single casualty, but their 18- and 32-pounder shot and shell rattled harmlessly upon their armoured sides, and their total casualties of two killed and 25 wounded were caused by chance shots, entering through the gun-ports. After four hours' brave defence, the Russian commander surrendered with the honours of war.

The ironclad dates its birth from this action, which demonstrated for the first time the possibility of protecting warships from the devastating effect of explosive shells. In 1857 the French converted the 91-gun screw ship *Napoléon* (renamed *Gloire*) into an armoured frigate with $4\frac{1}{2}$ -in. side plating from stem to stern, and from that time the system of armouring capital ships against gunfire has been extended and developed without a break.

Kincardineshire. County of Scotland, known also as the Mearns. It has about 32 m. of bold and rugged coast on the North Sea. The Grampians (Mt. Battock, 2,555 ft.) occupy the W. and central portions of the country, whence the undulating surface slopes N. to the Dee and S. to the Esk. In the S. is the Howe of the Mearns, a part of the great valley of Strathmore. Agriculture prospers in the valleys and



Kincardineshire. Map of the Scottish county between the Grampians and the North Sea

around the coast, and there are deer forests and moors. Fishing, both river and sea, is engaged in. Stonehaven, the co. town, Bervie or Inverbervie, Laurencekirk, and Banchory are the chief towns. Kincardineshire is included in the county constituency of North Angus and Mearns. John Arbuthnot, author and physician, friend of Pope and Swift, was born at Arbuthnott; James Beattie, poet of *The Minstrel*, was born near Laurencekirk. At Dunnotar Scott met Robert Paterson, whom he immortalised as *Old Mortality*. Area, 382 sq. m. Pop. est. 28,000.

Kinchau, CHINCHOW, or CHIN-HSIEN. City of China, in the N.E. Provinces, formerly Manchuria. It is on the main rly. from Mukden to Peking and 8 m. from the coast. It is a centre of transport, with rly. shops. Pop. 81,940.

Kinchinjunga. Mt. of the Himalayas. It is 75 m. E.S.E. of Mt. Everest and is the third highest mt. in the world (28,146 ft.)

It forms the majestic culmination of a great spur which extends S. from the main range. Its name means the "five treasure houses of the great snows," each of the five peaks being supposed to be a store of a different treasure. The mt. lies near the Nepal and Sikkim frontiers.

Kindergarten (Ger., children's garden). School for children between three and seven years of age. It is really a play school, in which children may satisfy their innate love of play through bead threading, paper folding, stick laying, building, sand drawing, modelling, cane weaving, or singing, dancing, and other rhythmic exercises and music. Friedrich Froebel (1782-1852) opened

the first kindergarten at Blankenburg in 1837. It expressed his belief that the "duty of a teacher consists in clearing the way for nature to do her proper work, to stimulate and to direct the child's activity without in any way interfering with it." Froebel saw a close analogy between the growth of the child and of the plant. He had been influenced by Pestalozzi, who emphasised the importance of the child rather than the curriculum. Although Froebel's plan was not generally accepted in his own country, he had a profound influence in Great Britain and America. A kindergarten school existed in London in 1850. The Froebel Society was started in 1875, and eventually a college was built at Kensington for the training of those who wished to become kindergarten teachers. *See* Education; Froebel System; Montessori.

Kinderscout. The highest point of the Peak dist., England. It is in Derbyshire, just N.W. of Edale,



Kinchunjunga, the third highest mountain in the world, seen from Tiger Hill, Darjeeling

and is 2,088 ft. high. Part of a grouse moor, it is also celebrated walking country. *See* Peak.

Kindersley, ROBERT MOLLS-WORTH KINDERSLEY, 1ST BARON (b. 1871). English banker. Born



Lord Kindersley,
English banker

Nov. 21, 1871, and educated at Repton, he entered business life and became chairman of the banking firm of Lazard Bros. A seat on the board of the Bank of England followed, and he was governor of the Hudson's Bay Co., 1916-25. Kindersley was president for four years of the National Savings Committee, and he was knighted in 1917; he also held the same appointment in the Second Great War. He was senior British representative on the Dawes committee, 1924. He was raised to the peerage in 1941. In 1946 he resigned from the board of the Bank of England and from the National Savings Committee.

Kinematics (Gr. *kinēma*, movement). Consideration of the theorems and problems of motion without reference to force or mass. Kinematics defines velocity or speed and acceleration, and finds formulae expressing the connexion between the acceleration, the speed or velocity, the distance travelled, and the time elapsed. The simplest formulae connecting these quantities are:

UNIFORM SPEED. If a point moves for t seconds with uniform speed v , the distance travelled s is given by the expression $s=vt$.

UNIFORM ACCELERATION. Let a be the acceleration. Then if the point start from rest it will acquire a units of speed in every second, and at the end of t seconds will have a speed v where $v=at$. If the distance travelled in any element of time dt is ds , then $ds/dt=v=at$, and the distance travelled from rest in t sec. is

$$s=\int_0^t at \, dt = \frac{1}{2} at^2.$$

If the point starts with an initial velocity, v_0 , the distance travelled in t sec. will be

$$s=v_0t+\frac{1}{2}at^2.$$

For accelerations and for speeds that are not uniform much more complicated expressions are found.

The constant acceleration due to gravity is designated by g and equals approximately 32 ft. or

981 cm. per sec. per sec. *See* Mechanics.

Kinshma. Town of Central Russia. Situated in the Ivanov region, 55 m. S.E. of Kostroma, on the right bank of the Volga, it is the terminus of a branch rly. from Ivanovo Voznesensk. It is a mart for trade in cotton, sugar, salt, and grain crops. Pop. 75,378.

Kinetics (Gr. *kinētikos*, of, or for, putting in motion). Branch of applied mathematics dealing with the action of forces to produce or change the motion of a body. For most purposes the word has now been replaced by *dynamics*, but lingers in the adjective kinetic; e.g. kinetic energy is the capacity to do work imparted to a body by a force applied to it.

Kinetics is based on Newton's three laws of motion. The first—that every body remains in a state of rest or uniform motion in a straight line unless acted on by a force—provides the basic definition of a force. The second—that change of motion is proportional to the impressed force, and takes place in the direction in which the force acts—leads to the fundamental equation of dynamics: $F=ma$, where F is the force, m the mass and a the acceleration. A force is said to do work when it moves the point of application in the direction of the force. The third—that action and reaction are equal and opposite—extends the theory to include interaction between bodies.

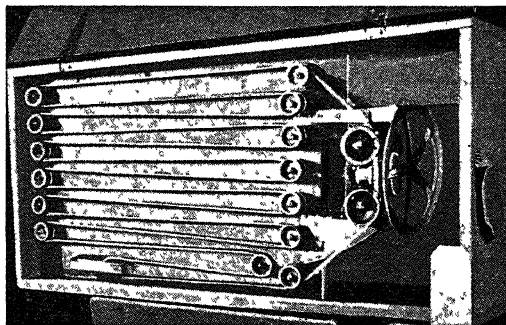
In kinetics the laws of motion are applied first to particles moving under the action of a constant force in a straight line. Then they are applied to other kinds of movement in a plane or in space. By a general principle enunciated by d'Alembert in 1743, the results

are adapted to the movement of solid bodies. More recently mathematicians have considered motion when the space itself is moving or varying. The theory of vibrations is also included in kinetics. The action of forces to produce or change the motion of a liquid is generally treated in hydro-dynamics, kinetics being confined to a consideration of

particles and rigid bodies. *See* Dynamics; Mechanics; Newton.

Kinetic Theory of Gases. Since a heavy gas will always move upwards to mix with a light one, and *vice versa*, it is evident that, though gases may appear to be at rest, there must be some kind of movement continually going on within the gas. The kinetic theory of gases supposes that in a gas the molecules are all endowed with a translatory movement, and furthermore to a first approximation that the spaces between adjacent molecules are large compared with the size of the molecules. Such molecules, which are considered to be perfectly elastic, are continually coming into collision with one another and with the walls of any containing vessel, upon which therefore they will exert a measurable pressure. *See* Gas.

Kinetoscope (Gr. *kinētos*, movable; *skopein*, to look). Name for the earliest form of instrument for showing moving pictures. Invented by Edison in 1893, it consisted of a small cabinet in which a film was put in motion by hand or motor power. The actual film was viewed through a magnifying glass. A similar type of instrument was invented by Lumière in France two years later, while, before Edison, Friese Greene had invented a moving picture camera. The discovery of a method of projecting moving pictures on to a



Kinetoscope. Interior of the instrument invented by Edison, showing the continuous strip of film passed over the small rollers and across the large rollers, between which it was seen through a magnifying glass

screen has virtually made the kinetoscope obsolete, save as a toy. *See* Cinematography.

King. Term used for a ruler. Of Teutonic origin, it means son of the tribe or kin, but is used for a variety of rulers. It is the usual English translation of Greek *anax* and Latin *rex*, while the chiefs of barbarian tribes are often referred to as kings. It is given in the

English Bible to a great number of rulers of different powers and times. In general it implies sovereignty, but of a limited kind; yet in the late German empire there were kings, *e.g.* of Saxony and Bavaria, who had not really sovereign power.

The word king or cyning was given to the petty rulers of the states of Anglo-Saxon England, an early reference being one to King Ella in the Anglo-Saxon Chronicle in 588. About the same time, in the countries that were afterwards France and Germany, the forms *roi* and *könig* came into use, as elsewhere did others, all translated by Latin chroniclers as *rex*. With the consolidation of countries from the 8th century, there was a decrease in the number of kings, until in the later Middle Ages it was almost the rule, in Europe at least, one country, one king. Germany and Italy, forming the medieval empire, were under an emperor who claimed to possess the right of creating kings.

The history of kingship falls roughly into three periods: before Charlemagne; from Charlemagne to Napoleon; and the 19th and early 20th centuries. In the first period, the title was given to any chief who was of any importance whatever, and meant very little.

Charlemagne's Influence

In A.D. 800 Charlemagne was crowned emperor at Rome, rising from king of the Franks to emperor of the Romans. He introduced the idea that still persists, that emperor is a higher title than king; he also introduced into the associations of kingship some of the Roman ideas of pomp and circumstance with which were mingled other ideas borrowed from Jewish practice. After his time, king became definitely a title carrying power and reserved to a few rulers, its only superior being emperor, as was seen by the custom of making the eldest son of the emperor king of the Romans. Later, the feudal system strengthened this tendency, and after a time the idea of divine right was grafted on to it. New kings were rarely made between 1000 and 1800, that of Prussia in 1701 being something of a novelty.

This period differed from the one before it in that kingship became territorial. The earlier kings, *e.g.* Egbert and Charles the Bald, had been kings of the people, of the Angles or Franks. The later ones, *e.g.* Philip Augustus and Henry II, were kings of the land. In the 19th century the earlier practice

was revived: Louis Philippe called himself king of the French; George, king of the Hellenes; Leopold, king of the Belgians.

With the French Revolution came a fresh period. The Holy Roman Empire fell to pieces, but Napoleon, taking the title of emperor, regarded himself as able to create kings, and did so. The congress of Vienna made Hanover into a kingdom, and this period of change saw also the creation of kings in Saxony and Bavaria. Then came the revolutions of the 19th century, fresh kings and kingdoms coming into being as peoples, *e.g.* Italians, Greeks, Serbs, Rumanians, and Belgians became independent nations, each establishing its own royal dynasty.

The result was an increase in the number of kings, but with the approach of the 20th century the process was reversed. Republican ideas made headway. France, leading the way, established a stable state in which was neither king nor emperor, and later Portugal drove out her king (1910). The First Great War added impetus to the spread of republicanism, and kings disappeared from Germany and Austria-Hungary. Among the new states formed after the war only Yugoslavia accepted a king, Greece for many years fluctuated in its sentiments. Spain ceased to be a kingdom in 1931 and Albania's brief-lived monarchy ended with Mussolini's invasion and the king's flight, 1939. Italy dethroned her king in 1946. On the other hand, the British conception of kingship not only outlasted both Great Wars but in several ways emerged from them broadened and strengthened, partly by the increasing importance of the crown as the sole constitutional link binding the British Commonwealth, but also by the personal characters of the two monarchs concerned (George V and George VI) as revealed in the exercise of their unique functions. Kingship on similarly democratic lines retains its hold in a few other countries of W. Europe, and it is worth noting that it has shown itself firmly enough based to survive the controversial actions of individual kings such as the British Edward VIII or the Belgian Leopold III.

King. At chess, the piece on each side on which strategy is based; for the object of chess is to place the opponent's king in such a position that it must be captured on the next move. It is not a powerful piece, its move being one square in any direction

(except for one special move called castling). When the game developed in the East this piece was at first called *raja* or *shah*; and from Arabic *shahmat*, the king is dead, is derived the term checkmate. See Chess *illus.* p. 1996.

King. One of the picture cards in each suit in a pack of playing cards. In most games it ranks next highest after the ace, but in some older games and most forms of patience it is the highest card. The persons supposed to be represented by the four kings in earliest French packs are David (spades), Alexander (clubs), Julius Caesar (diamonds), Charlemagne (hearts).

King, EDWARD (1829-1910). A British prelate. Born Dec. 29, 1829, and educated at Oriel College, Oxford, he took orders in 1854. He was principal of Cuddesdon theological college from 1863 to 1873, when he was made canon of Christchurch and regius professor of pastoral theology at Oxford. He was bishop of Lincoln from 1885 until his death on March 8, 1910. A friend of Pusey, he was prosecuted for ritualistic practices, the use of which led to the Lincoln judgement (*q.v.*).

King, ERNEST JOSEPH (b. 1878). American sailor, born Nov. 23, 1878, at Lorain, Ohio. He passed through the naval academy at Annapolis, served in the Spanish-American war of 1898, and during the First Great War was chief of staff to the c.-in.-c. of the fleet. Promoted vice-admiral in 1938, he commanded the aircraft battle force. On Feb. 1, 1941, King was given command of the Atlantic Fleet, and on Dec. 20 became c.-in.-c. of the U.S. fleet, also chief of naval operations on March 9, 1942. He participated in several conferences on British-American strategy. Promoted to the new rank of fleet admiral, he retired after the war.

King, SIR FREDERIC TRUBY (1858-1938). New Zealand physician. Born at Wellington, he was educated at Edinburgh university. In 1907 he founded the Plunket Society (Royal New Zealand Society for the health of women and children) and during 1921-27 was director of child welfare in New Zealand. In London he established the Mothercraft Training Society, such centres later becoming established in other countries. Knighted in 1925, Truby King died at Wellington, Feb. 9, 1938.

King, HENRY (1592-1669). An English poet and prelate. Son of John King, later bishop of London, he became the archdeacon of

Colchester in 1617, and bishop of Chichester in 1642. During the Civil War he lost his estates, but was brought back to wealth after the Restoration, dying Sept. 20, 1669. His collected poems appeared in 1657; they include elegies on Jonson and Donne, who were both close friends of King, and the Exequy on his Wife; but the authorship of several was later questioned.

King, LEONARD WILLIAM (1869-1919). British archaeologist. Born in London, Dec. 8, 1869, he was educated at Rugby and King's College, Cambridge. He entered the British Museum as assistant in the department of Egyptian and Assyrian antiquities, and having engaged in excavating work at Nineveh in 1903-04, was chosen assistant keeper of the dept. in 1912. From 1915 professor of Assyrian and Babylonian archaeology at King's College, London, he died Aug. 22, 1919. King's works include Babylonian Magic and Sorcery, 1896; Letters of Hammurabi, 1898-1900; Seven Tablets of Creation, 1902; History of Sumer and Akkad, 1910.

King, WILLIAM LYON MACKENZIE (b. 1874). Canadian statesman. He was born at Berlin (now



W. L. Mackenzie King,
Canadian statesman

Kitchener), Ont., Dec. 17, 1874, educated at Toronto university, and held fellowships in political science at Chicago and Harvard. He was deputy minister of Labour and editor of the Labour Gazette, 1900-08; then entered parliament as Liberal member for N. Waterloo, Ont., and was minister of Labour, 1909-11. He succeeded Sir Wilfred Laurier as leader of the Liberal party in 1919, leading the opposition until 1921. He was prime minister, president of the privy council, and secretary for external affairs for nine years from 1921, except for a short period in 1926; and assumed the same offices in 1935. In 1946 he laid down the secretaryship for external affairs.

Mackenzie King concluded the Ogdensburg Agreement with President Roosevelt in 1940, instituting a permanent joint defence board for the study of problems relating to the northern half of the western hemisphere. In 1942 he introduced a conscription bill, after a plebiscite on this issue had

been taken. He attended the Quebec conference in 1943 and that at San Francisco in 1945. Defeated that year in the general election, which his party nevertheless won, he was returned to parliament by a by-election for Glengarry. At Washington he discussed with President Truman and C. R. Attlee the control of atomic energy and the secret method of production. King was made a C.M.G. in 1906; and after 21 years' (12 of them consecutive) service as Canadian prime minister was awarded the O.M., Nov., 1947. He went to London for the conference of Commonwealth prime ministers in 1948, but illness prevented him attending the meetings, and he retired from the premiership and the leadership of the Liberal party the same year. He was succeeded by Louis St. Laurent (*q.v.* in N.V.). In 1949 King announced his wish to bequeath his personal archives to the Canadian nation.

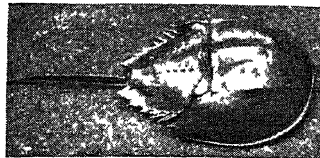
King Bird (*Tyrannus*). Genus of American fly-catcher. Its name is probably due to the boldness with which it attacks much larger birds, even hawks, if they venture near its nest. Its plumage is blackish on the upper parts, with white and grey beneath, and the crown of the head is yellow. It is common in many parts of the U.S.A., and feeds mainly on insects, catching them on the wing.

King Charles Spaniel. Breed of toy dog, so called because it came into favour in Charles I's reign. As shown by Van Dyck, the King Charles was liver and white in colour, and sharp-nosed, but in the 19th century the fashionable colour was black and tan, and pug-nosed pets with a pedigree fetched considerable prices. The King Charles ranges between 7 lb. and 10 lb. in weight. The skull should be domed and the eyes full, the ears long and drooping and set close to the body. The coat is thick and silky, the legs and tail (which is carried low) being well feathered. The Blenheim and Ruby or Prince Charles spaniels are more lightly coloured.

King Christian IX Land. Part of S.E. Greenland. It lies S. of King William Land and N. of King Frederick VI Land, being intersected by the Arctic Circle. Its

coastline is deeply cleft by the Bay of Terrors and numerous fjords, and its interior is perpetually covered by an ice-sheet.

King Crab (*Limulus*). Name given to a group of marine arthropods placed by zoologists in the



King Crab (*Limulus*). Above, in natural position; below, lying on its back

class Arachnida. They differ in many respects from the crabs, and are more nearly related to the extinct trilobites. The body is almost completely covered by a large spreading shell or carapace, which allows little to be seen but the long, spike-like tail.

King crabs occur on the E. coast of the U.S.A., off China and Japan, and around the Indo-Pacific islands. Unable to swim, they are found in comparatively shallow water, crawling on the bottom. At times they bury themselves in the mud, the tail being used as a prop to assist in changing position. The eggs are deposited in the sand at high tide mark. See Crab.

Kingcup. Alternative name for the marsh marigold (*q.v.*).

Kingdom, THE. An oratorio by Elgar. Part of an uncompleted trilogy, it forms the sequel to The Apostles (*q.v.*), and was first performed at Burningham, on Oct. 3, 1906, when the solo singers were Agnes Nicholls, Muriel Foster, John Coates, and William



King Charles Spaniel.
Champion of the breed

Higley. The story is taken from early chapters of The Acts, and includes the miracles of healing and the gift of the Spirit at Pentecost. The setting of Our Father, which leads to the finale, opens with a version of a theme from The Dream of Gerontius.

King Edward VII. A British battleship. Name ship of the last big group of the pre-Dreadnought

fleet, she was launched at Devonport in 1903, and completed in 1905 at a cost of £1,382,675. Principal details: length, 425 ft.; beam, 78 ft.; displacement, 16,350 tons; h.p., 18,000; speed, 18.5 knots; armament, four 12-in., four 9.2-in., and twelve 6-in. guns; main armour belt, 9 ins. thick. She served continuously as a flagship. On Jan. 9, 1916, she struck a mine in the North Sea and was abandoned, all on board being saved.

King Edward VII Land. Part of the Antarctic continent, S.E. of the Ross Sea. The Ross Ice Barrier connects it with Discovery Island. Ross was there in 1842 and Scott in 1902. Amundsen, before his successful dash to the South Pole, established his winter quarters on the barrier ice to the W.

King Edward's Horse. A mounted corps raised in 1901 among men from the British dominions resident in and near London. It was known as the 4th County of London Imperial Yeomanry. The recruiting area was extended to other parts of the kingdom, and in 1909 the regiment was renamed King Edward's Horse. At Givenchy, April 9, 1918, it filled the gap on the left of the 55th division and held up the enemy advance until the 51st division was able to restore the British front. The unit was disbanded in 1924.

Kingfisher (*Alcedinidae*). Family of birds of which representatives are found in most parts of



Kingfisher. Specimen of the British species
W S Berridge, F Z S

the world. The majority are of handsome appearance, and have powerful, dagger-like beaks with which they catch the fish or reptiles on which they feed. Great Britain has only one species, the common kingfisher (*Alcedo atthis*), the most beautiful of all British wild birds, having greenish-blue plumage, which flashes in the sunlight like an emerald. The back is azure, the tail deep blue, the wing coverts dark green spotted with cobalt, the throat white, and the under parts yellowish chestnut. It is 6 or 7 ins. long, and has red legs and feet.

The kingfisher is fairly common about the rivers in the S. of England. It is generally seen perched on a stump or branch overhanging the stream, watching for small fish. It also eats insects, and on

the coast feeds on small crabs. The nest is constructed at the end of a tunnel, usually in the bank of a stream, and is said to be partly made of fishbones, remains of its food. See Beak; Bird; Egg.

King Frederick VI Land. Most S.E. portion of Greenland, stretching N. from Cape Farewell to King Christian IX Land, between lat. 60° and 65° N. There are numerous capes, and the coast is cleft by fjords and fringed by several islands. It is sparsely populated.

King Frederick VIII Land. Name of the N.E. littoral of Greenland, between Germania Land on the S. and Amdrup Land on the N. The part of the coast fronting Jokel Bay is called Hertug, or Orleans Land. Like other portions of the E. coast, it is indented by many inlets and bordered by numerous islands.

King George V. Name of two British battleships. The earlier, one of five vessels of the Monarch class, was completed in 1913, displacing 23,600 tons on a length of 555 ft. and a beam of 89 ft. Her engines developed 27,000 h.p. to give a maximum speed of 21 knots. Main armament comprised ten 13.5 in. guns, and she had secondary batteries of twelve 4-in. and four 3-pdr. guns, also torpedo tubes.

She served with the Grand Fleet throughout the First Great War, taking part in the battle of Jutland, and was broken up in 1926.

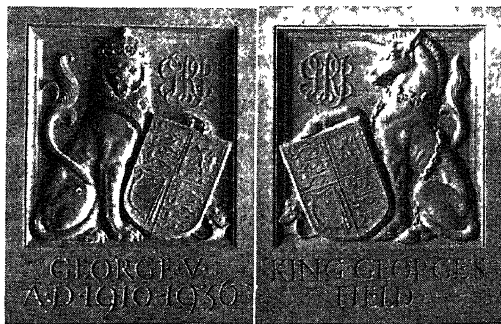
The second King George V, one of a class of four battleships, was completed in 1940. When fully loaded she displaces 44,650 tons on a length of 740 ft. and a beam of 103 ft. Her engines develop 112,000 h.p. to give a maximum speed of 28 knots. Armament comprises ten 14-in., sixteen 5.25-in., eight 40-mm., thirty-eight 20-mm., and eighty-eight 2-pdr. guns. The King George V took part in the action which sank the Bismarck in 1941, provided covering fire for Allied landings in Italy, and served with the Pacific Fleet against Japan and the Japanese-occupied islands. After the war she was transferred to a training squadron.

King George V Land. Tract of the Antarctic regions lying due S. of Tasmania, between Adélie Land

and Oates Land and N. of S. Victoria Land. It was explored by the Australasian expedition of 1911-14. The coast is broken by capes and bays and the tract contains the great Nimbus Glacier (*q.v.*).

King George VI Sound. In the Antarctic, separating Alexander I Land and Graham Land, long. 70° W. Discovered by Ry-mill's expedition of 1934-37 and named in 1938, the sound is 15 m. wide at the mouth and runs 250 m. S. before turning W. Volcanic rock and fossil remains are to be found on the banks.

King George's Fields. Playing fields bought for the public from a fund opened in 1936 as part of the national memorial to George V. By 1950 the administrative council of the fund had approved expenditure of £537,009 on the endowing of 499 fields—377 in England, 82 in Scotland, 32 in Wales, seven in N. Ireland, and one in the Channel Islands. Memorial fields in the



King George's Fields. Heraldic panels, designed by George Kruger Gray, as seen at the entrance of these memorial playing fields in England, Wales, and N. Ireland

colonies of Aden, Barbados, Falkland Islands, Malta, and Nigeria were also recognized. Each field has at its entrance an heraldic panel distinguishing it as part of the memorial. The capital value of the fields, which are administered in collaboration with the National Playing Fields Association, is approximately £3,199,692.

King George's Fund for Sailors. This was founded in 1917 to secure increased financial support for voluntary marine benevolent institutions in the U.K.

King George's Jubilee Trust. Fund inaugurated in 1935 in commemoration of the silver jubilee of George V. Its objects are the advancement of the physical, mental, and spiritual welfare of the younger generation.

King-Hall, STEPHEN (b. 1893). British journalist and broadcaster. He was born Jan. 21, 1893, son of Adm. Sir G. King-Hall, and

educated at Osborne and Dartmouth. He served with the Grand Fleet, 1914-17, and was later at the Admiralty, retiring from the navy in 1929 with the rank of commander. Secretary of study groups under the Royal Institute of International Affairs, 1929-35, he founded the K-H News-Letter Service (later National News-Letter) in 1936. King-Hall entered parliament in 1939 as Ind. Nat. member for Ormskirk, and in 1942 was appointed director of factory defence, ministry of Aircraft Production. He lost his seat at the election of 1945. Widely known for broadcasts to children on current affairs during the 1930s, he wrote *Letters to Hilary*, 1928; *Our Own Times*, 1935; *Britain's Third Chance*, 1943.



Stephen King-Hall,
British journalist

King-Hall's sister, Magdalen (Mrs. Patrick Perceval-Maxwell, b. July 22, 1904) wrote historical fiction, including *The Diary of a Lady of Fashion*, 1925; *Maid of Honour*, 1936; *Sturdy Rogue*, 1941; *Life and Death of the Wicked Lady Skelton*, 1944; and *How Small a Part of Time*, 1946.

King Henry the Fourth. Two historical dramas by Shakespeare. In Part I Henry Hotspur, son of the earl of Northumberland, forms a league with Owen Glendower and the earl of Douglas against the king, and is slain in battle at Shrewsbury by Henry prince of Wales. Connected with the historical scenes are the famous passages in which Falstaff (*q.v.*) is shown robbing and being robbed at Gadshill, drinking and drawing the long bow at the Boar's Head Tavern, Eastcheap, and playing the coward at Shrewsbury.

This part was written in 1596-97, and licensed 1598, six editions being issued before 1623 and two more in 1632 and 1639. It was built on an old play, *The Famous Victories of Henry V*, and on Holinshed's *Chronicles*. The fat knight was at first named Sir John Oldcastle, but the name was altered to Falstaff in deference to protests in favour of the real Oldcastle, a Lollard leader. Similar protests have been raised in regard to Sir John Fastolf of the Paston Letters. Prince Henry, later to be Henry V, is shown as boon companion to Falstaff and his rascals, while Hotspur, to

whom the most poetic passages are allotted, appears to be the hero, but provides the challenge which brings about the prince's reformation. The scene shifts between London, Rochester, Gadshill, Warkworth, Bangor, Shrewsbury, Coventry, and York. There are 3,170 lines, 1,464 in prose, 1,622 in blank verse, and 84 pentametric rhymes.

In part II the earl of Northumberland, hearing of his son Hotspur's death, flees to Scotland. Scroop, archbishop of York, and others raise an army against the king in Yorkshire. Invited by the earl of Westmoreland to a truce, they are persuaded to disband their army and then led off to execution. Falstaff is shown bandying jests with the lord chief justice, wheedling money out of Mistress Quickly of the Boar's Head, making love to Doll Tear-Sheet, pressing men for the war before Justices Shallow and Silence, carousing and exchanging memories with these two justices, and being repudiated by Prince Henry, who, having succeeded his father as king, retains in office the lord chief justice, despite the fact that he had once been sent to prison by him.

The play was entered for publication in 1600, the entry containing the first mention of Shakespeare's name in the books of the Stationers' Company. Controversy has arisen as to whether *Shallow* was intended as a satire on Sir Thomas Lucy of Charlecote. The scene shifts between Warkworth, London, York, Gloucestershire, Yorkshire, and Westminster, and this play is more episodic than Part I. There are 3,437 lines, including 1,860 in prose, 1,417 in blank verse, and 74 pentametric rhymes.

When Part I was revived at the Haymarket, 1896, Beerbohm Tree was Falstaff and Lewis Waller played Hotspur. George Robey acted Falstaff in Part I at His Majesty's, 1935. The Old Vic company at the New Theatre performed both parts in 1945, with Ralph Richardson as Falstaff. Consult *The Fortunes of Falstaff*, J. Dover Wilson, 1943.

King Henry the Fifth. Historical drama by Shakespeare. The king, having resolved to prosecute his claim to the French throne, crosses to France, where with forces inferior in numbers and poorly equipped he gains the memorable victory of Agincourt, and concludes peace by marrying the French king's daughter, Katharine. Relief to the serious action

is provided by the king's man-to-man conversation with Williams, a soldier, on the eve of battle, his robustious and humorous courtship of the princess, the quaint pedantry of Captain Fluellen, a Welsh officer, and the amusing vengeance which the captain takes on Pistol, a cowardly follower of Falstaff (whose death is described early in the play).

Completing with the two parts of Henry IV the trilogy which presents the development of Henry of Monmouth as a typical English hero, this play was entered at Stationers' Hall 1600, and published in imperfect form. The complete text was not in print before the 1623 folio. This is the only play of Shakespeare in which each act is introduced by a chorus. Produced in 1598, probably at The Globe, the "wooden O" of the opening chorus; based on Holinshed and *The Famous Victories*, in five acts it contains 3,320 lines: 1,531 prose, 1,678 blank verse, with 101 pentametric rhymes.

In a revival at The Lyceum, 1900, Lewis Waller played the king. Laurence Olivier took the part at the Old Vic, 1937; the film he made in 1944 was called *Henry the Fifth*.

King Henry the Sixth. Title of three historical dramas attributed to Shakespeare, but largely by other hands. Written between 1590 and 1592, they were included in the 1623 folio, described as Parts I, II, and III. Each is in five acts. Based on the *Chronicles of Holinshed and Hall*, they conjecturally represent work by Marlowe, especially in Part III; Greene, Peele, and possibly others. Their contemporary popularity is testified to by Nash.

Part I covers the period between the death of Henry V, 1422, and Henry VI's marriage with Margaret of Anjou, 1445. It depicts the feuds between York and Lancaster, Gloucester and Beaufort, the siege of Orléans, the fight before Angers, and the condemnation of Joan of Arc, here called La Pucelle and harshly treated by the dramatist. Shakespeare probably wrote only the Temple Gardens scene, Talbot's speeches, and perhaps Mortimer's death scene. Remarkable for errors in chronology and other anachronisms, the play contains 2,693 lines, 2,379 blank verse and 314 pentametric rhymes; and was first printed in 1623. Henry VI appears first in the third act. The hero is Talbot.

Part II, a transcript of the play published in 1594 as *The First Part*

of *The Contention* betwixt the two famous Houses of Yorke and Lancaster, continues the story of Part I from 1445 to the Yorkist victory at the first battle of St. Albans, 1455. Suffolk, who had promoted the French marriage, is now a duke. Gloucester, opposed to the union, is plotted against by Suffolk, Buckingham, Somerset, and the queen, is humiliated by Henry, and his duchess is arrested on a charge of witchcraft. Gloucester's enemies prevail; he is arrested and murdered. York goes to Ireland as regent; Suffolk, banished, is killed by pirates; Beaufort dies in remorse; York, having fostered the Jack Cade rising, returns from Ireland and defeats Henry at St. Albans. The play contains 3,032 lines: 448 prose, 2,562 blank verse, and 122 pentametric rhymes.

Part III is a revision of the Second Part of *The Contention* or, as it was separately entitled, *The True Tragedie of Richard Duke of Yorke*, of which the earliest extant copy is dated 1595. The duke of York agrees that Henry shall remain king, provided that York shall be his successor. Queen Margaret, repudiating this agreement, defeats the Yorkists at Wakefield, where the duke is killed by Clifford and the queen. Edward, the new duke, and Warwick win the battle of Towton, at which Clifford is slain. York, now King Edward IV, Henry having been consigned to the Tower, sends Warwick to France to ask for the hand of Princess Bona. But Warwick, learning that Edward has already married Lady Grey, renounces him and, joined by Margaret and Edward's brother Clarence, releases Henry from the Tower, and imprisons Edward. The latter escapes to Burgundy, returns to London, deposes Henry, is rejoined by Clarence, and defeats the Lancastrians at Barnet, where Warwick is slain. Margaret is beaten at Tewkesbury and taken prisoner; her son Edward is murdered; and Henry is stabbed to death in the Tower by Richard of Gloucester. The play has 2,904 lines, including 2,749 blank verse, and 155 pentametric rhymes.

The three parts were given consecutively for the only time by Benson's company at Stratford in 1906. An abbreviated version was broadcast in 1947.

King Henry the Eighth. Last historical drama attributed to Shakespeare, but partly written by another hand—perhaps John Fletcher. Cardinal Wolsey procures the execution of Buckingham and

brings about a meeting between the king and Anne Bullen. The king brings his marriage to his brother's widow, Queen Katharine, before an ecclesiastical court. Wolsey, having inadvertently enclosed compromising documents in a packet sent to the king, is condemned by the king, who has already married Anne Bullen, to forfeit all his offices. Arrested at York, he dies at Leicester. Gardiner, bishop of Winchester, having accused Crammer, archbishop of Canterbury, of heresy, orders him to be committed to the Tower. This order is frustrated by Crammer's production of the king's ring and by the king's nomination of the archbishop as sponsor at the baptism of Princess Elizabeth. In the closing scene Crammer prophesies the greatness of Elizabeth and her successors.

King Henry the Eighth was at first called *All is True*. While the facts are substantially accurate, they are at variance with chronological sequence. Of the 17 scenes, Shakespeare is credited with six. The play is based on Holinshed's *Chronicles*, Cavendish's *Life of Wolsey*, and Foxe's *Acts and Monuments*. Written about 1611-12, it contains Shakespeare's latest dramatic work. The scene is chiefly in London and Westminster, once at Kimbolton. First printed in 1623, and in five acts, its 2,754 lines include 67 in prose, 2,613 in blank verse, and 16 pentametric rhymes. During a performance at The Globe, June 29, 1613, chambers or stage cannon fired the thatched roof of the theatre, and the building was destroyed. In a revival at The Lyceum, 1892, Irving played Wolsey, Terriss the king, and Ellen Terry Katharine. There was a memorable production at His Majesty's in 1910, with Tree as Wolsey, and Bouchier as the king.

Kinghorn. A royal burgh of Fife, Scotland. It stands on the Firth of Forth, 2½ m. N. by E. of Burntisland, with a rly. station. Here, on March 12, 1286, Alexander III was killed when his horse fell over the cliff. There is a battery at Kinghorn Cliff in connexion with the Forth defences. S. Leonard's church and the town hall are modern. Pop. 2,708.

Kingsapp. A river port of Russia, in Leningrad region and 75 m. S.W. of that city. It dates from the 12th century. Driven out during the German advance, Aug. 18, 1941, the Russians retook it Feb. 1, 1944, during their progress towards Estonia.

King John. Historical drama by Shakespeare. The quarrel between England and France is composed by the marriage of Blanche, niece of John, to Lewis the Dauphin. This agreement is deemed accepted by all parties except Constance, mother of the rightful heir to England, Arthur. Philip Faulconbridge (a favourite acting part) utters a soliloquy on commodity or self-interest. Constance having denounced the French king and the archduke of Austria for withdrawing their support from her son's claim to the English crown, the alliance between England and France is broken by Pandulph, the pope's legate, who excommunicates John for refusing to allow Langton to take possession of the see of Canterbury. On the renewal of war John kidnaps his nephew Arthur, and Lewis invades England. Hubert de Burgh breaks his promise to John to burn out the eyes of Arthur, who meets his death by leaping from the walls of a castle. Pandulph having received John's submission to the pope, and the nobles having rallied to the crown, peace is made, but John dies poisoned by a monk.

This play, mentioned by Meres in 1598, was written about 1594, but not printed before 1623. Two earlier works on King John existed: a morality by Bishop Bale, first printed 1838, and the anonymous and anti-Catholic *Troublesome Raigne of King John*, first printed in 1591. Reissues of the latter in 1611 and 1622 were falsely attributed to Shakespeare. The scene of his play, which is in five acts and makes no mention of Magna Carta, is partly in England, at Northampton, Bury St. Edmunds, and Swinstead Abbey, and partly in France. Of its 2,553 lines, 2,403 are in blank verse and there are 150 pentametric rhymes. It closes with the memorable words of Faulconbridge:

Come the three corners of the world in arms,
And we shall shock them Nought shall make us rue,
If England to itself do rest but true

At Her Majesty's in 1899, Beer-bohm Tree appeared as the king, Lewis Waller as Faulconbridge, and Julia Neilson as Constance. At Sadler's Wells in 1931, Robert Speaight was John and Ralph Richardson Faulconbridge.

Kinglake, ALEXANDER WILLIAM (1809-91). British historian. Born at Taunton, Aug. 5, 1809, he was educated at Eton and Trinity College, Cambridge, and became a barrister. Experiences gained on travels, while still a student, in

the East led him to write in 1844 Eothen, an acknowledged classic, and his interest in military matters took him in 1845 to Algiers, where he joined a French column. In 1854, during the war, he was in the Crimea. During 1857-68 he was M.P. for Bridgewater. He died January 2, 1891. His *History of the Crimean War*, published in 8 volumes, 1863-87, is a graphic and detailed narrative of the struggle, and virtually represents Kinglake's life-work. He owed the suggestion of the work to Lord Raglan, who gave him access to private papers.

King Lear. Tragedy by Shakespeare. Lear, king of Britain in some period B.C., a widower weary of the world, decides to divide his kingdom between his three daughters, Goneril, Regan, and Cordelia. Goneril is married to the duke of Albany; Regan to the duke of Cornwall. Flattered by the elder daughters and angered by Cordelia's simple remark that she cares for him as a daughter should, he disinherits Cordelia, who departs as the wife of the king of France. Flouted by Goneril and refused hospitality by Regan, Lear becomes a wanderer and loses his reason, finding comfort only in the companionship of his discarded servant, the earl of Kent, and his Fool. Cordelia, learning his fate, lands with an

army to dethrone her sisters. This is defeated near Dover, and she and Lear are taken prisoner.

The by-plot narrates the parallel afflictions of another father, the earl of Gloucester, whose illegitimate son, Edmund, with whom Goneril and Regan are both carrying on intrigues, induces Regan's husband to put out Gloucester's eyes on pretence of his treachery. This secures for Edmund the inheritance of Gloucester's real son, Edgar, who is compelled to assume the guise of a Tom o' Bedlam. Edmund, who falls by Edgar's sword, repents too late to save Lear and Cordelia, and the king expires on learning that Cordelia has been hanged. Goneril, in a fit of jealousy, poisons Regan and then stabs herself.

Shakespeare's supreme effort in tragedy was first produced at court, Dec. 26, 1606. It is based on Holinshed and an earlier anonymous play, *The True Chronicle History of King Lear and his Three Daughters*. Its main plot was derived from a legend told with variations by Geoffrey of Monmouth, Wace, Layamon, in the *Gesta Romanorum*, Spenser, and in a ballad of uncertain date in *Percy's Reliques*. The by-plot was adapted from Sidney's *Arcadia*, 1590. In plot and by-plot Shakespeare substituted a tragic for a happy ending. The Fool, who acts as a kind of chorus, is the only Fool in Shakespeare's tragedies. The text of the three quartos of 1608 differs from that of the 1623 folio. As usually printed the play contains 3,298 lines, including 903 prose, 2,238 blank verse, and 74 pentametric rhymes.



Elliott & Fry

Many critics, e.g. Hazlitt, have urged that the tragedy of this play is scarcely tolerable on the stage, and until the 20th century it was more read by scholars than acted for the public. Outstanding actors as Lear were Donald Wolfit, St. James's, 1943, and elsewhere; William Devlin, Westminster, 1934, and Old Vic, 1936; John Gielgud, Old Vic, 1931 and 1940. Consult Shakespearean Tragedy, A. C. Bradley, 1904.

King of Arms. One of the chief heralds, or officers of armoury. They were first known as kings of heralds, but Henry IV changed the title to that of kings of arms. Three of them—Garter, Clarenceux, Norroy—are members of the Heralds' College. Bath king of arms was instituted in 1725 as herald to the Order of the Bath. In Scotland the chief herald is the Lord Lyon king of arms. There is also Ulster king of arms. All these kings are entitled to wear coronets, composed of a circlet surmounted by sixteen oak leaves, collars of Ss, and armorial tabards, and to bear sceptres, or batons surmounted by crowns. See Heralds' College.

King Oscar II Land. Part of the Antarctic continent. It is situated N. of Graham Land in the section nearest to S. America, and lies between the Bellingshausen and Weddell Seas. Mountainous and icebound, it was visited by Nordenskiöld in 1902-03.

King Over the Water. Jacobite toast. After the revolution of 1688, the adherents of the exiled Stuarts passed their wine-glass over their finger-bowl or some other vessel containing water when the health of the king was proposed, thus indicating their loyalty to the exiled king "over the water," while ostensibly conforming to the requirements of the occasion. Owing to this Jacobite practice, finger-bowls were officially forbidden at banquets to royal persons in Great Britain, except before the sovereign himself. The prohibition was not removed until after Edward VII came to the throne. See Jacobites.

King Post. In engineering, a post or strut from the apex to the base of a triangular construction, used for distributing the loads on the structure. King posts are commonly seen in roof construction, bridges, etc. See Bridge.

King Richard the Second. Historical play by Shakespeare. John of Gaunt's son, Henry Bolingbroke, duke of Hereford, challenges the duke of Norfolk,



King Lear. Lear and Cordelia, who comes to succour her father in his misfortunes but is taken prisoner

From the painting by G. W. Joy, in the Leeds City Art Gallery

whom he accuses of the murder of the duke of Gloucester. Richard II banishes Norfolk for life and Bolingbroke for six years. Richard hears the dying Gaunt—who has just delivered the famous speech on "this England"—warning him against flatterers, but seizes his estates and goes to Ireland, leaving his uncle, the duke of York, as lord governor of England. Bolingbroke, claiming his father's patrimony, lands at Ravenspur. He is joined by the earl of Northumberland and by York. Richard, reaching Wales from Ireland, is brought to Westminster and deposed, and Bolingbroke makes himself king. York, discovering that his son has entered into a conspiracy to assassinate Bolingbroke, now Henry IV, discloses the plan to the king, who offers pardon. Sir Pierce of Exton, to win Henry's favour, murders Richard in prison.

Founded on Holinshed, Stow's Annals, and Berners' Froissart, this play was first published anonymously in quarto in 1597, and reissued with the author's name in 1598, each time without the deposition scene; this was restored in the quarto of 1608 and in that of 1615, after the death of Elizabeth. The text of the 1623 folio follows that of the 1615 quarto. Two earlier plays dealt with the same theme—one has been identified with *The Life and Death of Jack Straw*, given in Doddsley; the other, called *Richard II*, was first printed from the Egerton MS. in 1870. Shakespeare's play, which was mentioned by Meres in 1598, covers the two closing years of Richard II's life, but is not chronologically accurate. Of its 2,644 lines, 2,107 are in blank verse and 537 pentametric rhymes.

Beerbohm Tree frequently revived it at His Majesty's from 1903 on. John Gielgud played Richard at the Old Vic, 1929, and Alec Guinness at the New Theatre, 1947.

King Richard the Third. Historical play by Shakespeare. It completes the story of the Wars of the Roses dealt with in *King Henry the Sixth*. Richard, duke of Gloucester, in pursuance of his plan to secure the crown, induces Edward IV to send his brother Clarence to the Tower, and marries the widow of the son of Henry VI. He is cursed by Margaret of Anjou, whose husband and son he murdered. Becoming protector on the death of Edward IV, he commits his nephews to the Tower. Having with feigned

reluctance assumed the crown, he causes the two young princes to be murdered. Buckingham, mindful of the fate of Rivers, Grey, Vaughan, Hastings, and others, joins the cause of Richmond, afterwards Henry VII, who lands in England to claim the crown. Buckingham is executed. Afflicted before battle with the ghosts of his victims, Richard dies on Bosworth Field and Richmond decides to end the wars by marrying Edward IV's daughter.

Written about 1593, this play was first printed in quarto in 1597. The 1623 folio was followed by additional quartos in 1624, 1629, and 1634. It was based on Holinshed, who was indebted to Hall and More. There were two earlier plays, the anonymous *True Tragedy of Richard the Third*, 1594, and the Latin play, *Ricardus Tertius*, by Thomas Legge, acted at S. John's College, Cambridge, in 1579. Demonstrating strong evidence of Marlowe's influence, its chief characters are the king himself and Margaret of Anjou, the only person Richard fears, who acts as Nemesis. The play was at once a favourite, as witness contemporary references to the acting of Burbage in the title rôle; and even Colley Cibber's crude acting version did not prevent the performances of Garrick, Kemble, and especially Edmund Kean from being memorable. Of the later Richards, Irving, who in 1896 for the first time banished Cibber's version, is the most famous. Laurence Olivier played the king at the New Theatre, 1944; and Donald Wolfit frequently. The play contains 3,599 lines; 55 prose, 3,374 blank verse, and 170 pentametric rhymes.

King's. Prefix given to the titles of the following ten regiments of the British Army: The 3rd King's Own Hussars, The 8th King's Royal Irish Hussars, the 14/20th King's Hussars, The 15/19th King's Royal Hussars, The King's Own Royal Regiment (Lancaster), The King's Regiment (Liverpool), The King's Own Scottish Borderers, The King's Own Yorkshire Light Infantry, The King's Shropshire Light Infantry, the King's Royal Rifle Corps. One Territorial Army regiment has the prefix, The King's Own Royal Regiment (Norfolk). King's regiments with territorial titles are described under their territorial designation, e.g., Scottish Borderers, King's Own.

Kings, Books of. Two books of the Old Testament. The O.T. First and Second Books of Kings

are called in the Septuagint (cod. Vat.) the Third and Fourth Books of Kingdoms, and in the Vulgate the Third and Fourth Books of Kings (our 1 and 2 Samuel being in each version the First and Second Books). They contain a history of the Hebrew kings from the accession of Solomon (c. 970 B.C.) to the end of the monarchy in 586 B.C. The section 1 Kings 1-2 is a direct continuation of 2 Sam. 9-20. The rest of the contents falls into three divisions: (1) Solomon, 1 Kings 3-11; (2) the Divided Monarchy, 1 Kings 12-2 Kings 17; (3) the Jewish Monarchy, 2 Kings 18-25. Reference is made in the books, for other information than that recorded, to several documents, such as the Book of the Acts of Solomon, the Book of the Chronicles of the Kings of Israel, and the Book of the Chronicles of the Kings of Judah (neither of these, of course, being our 1 and 2 Chronicles).

The books themselves in their present form are composite, and scholars have sought to separate the various strata in the compilation. Thus the following narratives among others, have been distinguished: Annals of Israel, Annals of Judah, Annals of Solomon, Temple records, and Prophetic Narratives (including Early Ephraimite Elijah Stories). The compiler has fitted his materials into a frame-work which in general is easily distinguishable. "It comprises the chronological details, references to authorities, and judgements on the character of the various kings, especially with reference to their attitude at the high places—all cast in the same literary mould, and marked by the same characteristic phraseology" (Driver). See Bible; Criticism, Biblical; Old Testament.

Bibliography. The Two Books of the Kings, W. E. Barnes, 1908; Decline and Fall of the Hebrew Kingdoms, T. H. Robinson, 1926; History of Israel, W. O. E. Oesterley and T. H. Robinson, vol. 1, 1932.

King's African Rifles. Native infantry regiment founded in 1890 and recruited from some 200 tribes in Kenya, Uganda, Tanganyika, Somaliland, and Nyasaland. The majority are Zulus. Native soldiers of the K.A.R. are called Askari. The regiment gave invaluable service in the E. Africa campaigns of the First Great War, and in the Second it served on all fronts there from the evacuation of British Somaliland to the capture of Gondar. One company held Moyale fort for several days against over-

whelming numbers; the regiment also earned distinction at the Juba river. It took part in the Madagascar campaign, and several battalions served in Burma.

A special K.A.R. distinguished conduct medal can be awarded, while there is also a K.A.R. long service and good conduct medal. In peace time this is the only armed force in E. Africa. It has a normal strength of five infantry battalions, a camel corps, and a supply and transport section. Two battalions are stationed in Nyasaland and one each in Uganda, Tanganyika, and Kenya. The camel corps acts as a mounted constabulary in Somaliland. Regimental headquarters are in London.

King's Bench Division. Division of the high court of justice, to which the jurisdiction of the former court of king's bench was assigned by the Judicature Act of 1873. By an order in council of 1881, the common pleas and exchequer divisions were also merged in the king's bench division, which now consists of the lord chief justice of England as president and not fewer than 17 judges.

The title preserves the name of the court of king's bench, so called because the king formerly sat there in person on a raised bench, with the judges who determined the causes sitting on a low bench at his feet. It was a court of record and the supreme court of common law in the kingdom. It had no fixed place, but might follow the king's person wherever he went.

For some centuries it sat at Westminster, removing to the royal courts of justice in the Strand, by statute constituted the palace of justice, on the opening of the buildings in 1882. Its jurisdiction was high, keeping all inferior jurisdictions within the bounds of their authority, and having power either to remove their proceedings to be determined there or to prohibit their progress below; it superintended all civil corporations in the kingdom; and it protected the liberty of the subject by speedy and summary interposition.

In the crown side, or crown office, it took cognizance of all criminal causes from high treason downwards; and in the plea side, or civil branch, it has an original jurisdiction and cognizance of all actions of trespass or other injury alleged to be committed *vi et armis*, and of actions which alleged any falsity or fraud, all of which savoured of a criminal nature although the action was brought for a civil remedy. By a series of fic-

tions (*q.v.*) it had an acquired jurisdiction in all personal actions whatsoever. Recourse could be had from the court of common pleas to the court of exchequer chamber. See Judge; Supreme Court.

King's Birthday. The date fixed for official celebrations and parades in honour of the British sovereign. In the reign of Victoria it became customary to troop the colour on the Horse Guards Parade on her birthday, May 24. Edward VII, who was born Nov. 9, 1841, commanded that the official celebrations should be in June. George V and Edward VIII were born in June. In the reign of King George VI the official birthday was kept on a Thursday in that month, the King's actual birthday being Dec. 14. See Trooping the Colour.

Kingsbridge. A market town, seaport, and urban dist. of Devon, England. It stands at the head of Salcombe Bay, 15 m. W.S.W. of Dartmouth, and has a railway station. It has an old church, S. Edmund's, mainly a Perpendicular building, and a town hall with a museum. There is a grammar school founded in the 17th century. In the Middle Ages Kingsbridge was governed by a portreeve; later it was a centre of the woollen manufacture. It still has a fair and is famous for ale. The parish includes Doddbrooke. Here John Wolcot, known as Peter Pindar (*q.v.*), was born. Market day, Wed. Pop. 3,300.

Kingsbury. A part of the bor. of Wembley, Middlesex, England. It is near the Brent reservoir, to the N. of Neasden, with a station on the Bakerloo line. West of that part of the Edgware Road known as Watling Street is Kingsbury Green. The old parish church of Kingsbury-cum-Neasden, S. Andrew's, restored in 1870, is said to contain vestiges of Saxon architecture, and has some old monuments and brasses. In the churchyard is the vault of William, 3rd earl of Mansfield. The manor was given by Edward the Confessor to Westminster Abbey. Kingsbury, which was part of Wembley, 1894-1900 as also from 1934, was rural until the 1920s, when its pop. multiplied by eight.

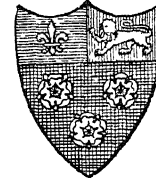
King's Champion. The function of this official is described under Champion.

Kingsclere. Market town and parish of Hampshire, England. It is 9 m. N.W. of Basingstoke, and is noted for its racing stables. The Norman church of S. Mary is a fine building, with some brasses and other memorials. Burghclere,

4 m. away, is the station, and in the vicinity is Highclere Castle, a seat of the earl of Carnarvon. Pop. 2,243.

King's College. A college of Cambridge university, England.

It was founded in 1441 as the college of S. Nicholas by Henry VI, who extended it as the college of S. Mary and S. Nicholas, for a provost and 70 fellows and scholars, directly connected with



King's College, Cambridge, arms Eton. The original site E. of Milne Street is now part of the university offices. The chapel, the foundation stone of which was laid by Henry on July 25, 1446, is the only part of his design completed, in 1515, according to his will. It is described as the finest example of ornate Perpendicular architecture in existence, notable in particular for its fan and lierne vaulting, the carving of the choir stalls, the wooden organ screen, and the wonderful windows with their 16th century glass, which escaped mutilation during the Civil War. Milton, Wordsworth, and Tennyson have sung its praises.

For a time the college, which has been several times extended, was exempt from the jurisdiction of the chancellor, and until 1851 King's men could proceed to a degree without passing the usual examinations. Open scholarships were founded in 1861, and undergraduates not on the foundation were admitted. Among the alumni are Sir John Cheke, Mulcaster, Walsingham, Sir John Harington, Edmund Waller, Sir Robert and Horace Walpole, Sir William Draper, John Keate, Stratford Canning, J. K. Stephen, W. R. Inge, Rupert Brooke, Lord Keynes. The society consists of a provost, 46 fellows, and 48 scholars. In The End of a Chapter, Shane Leslie gives an excellent picture of undergraduate life at King's about 1900. See colour frontis. to Vol. 4.

King's College. College of the university of London. It was established in 1829 for the purpose of giving instruction in literature and science, and was conducted on Anglican lines. In 1838 the engineering department was founded, and in 1839 the existing medical dept. developed into King's College Hospital. In 1847 a theological department was founded, and in 1856 were started evening classes, long a feature. After 1903 it was



King's College, London. East side of the quadrangle, from the Strand entrance

no longer necessary for professors and lecturers, except in theology, to be members of the Church of England. By an Act of 1908 the college was reorganized, various auxiliary activities being made independent. These included King's College School (*v.i.*), and King's College Hospital (*v.i.*).

On the teaching staff were Lyell, professor of geology, 1831-33; Daniell, professor of chemistry, 1831-45; Wheatstone, professor of experimental philosophy, 1836-70; Clerk Maxwell, professor of natural philosophy, 1860-63; and Lister, professor of clinical surgery at the hospital, 1877-92. The college has a department for the training of teachers and provides residential facilities in its hostels. It grants the diploma of associate (A.K.C.) to graduates who have taken a course in divinity. Since 1910 it has been incorporated in the university of London. The buildings are in the Strand, adjoining Somerset House, and include libraries, laboratories, and museums. The principal is appointed by the crown and the dean by the council.

King's College for Women, established as a separate department in 1881, was made independent in 1908, and was moved from the Strand to 13, Kensington Square. In 1910 it was incorporated with the university of London, and in 1915 the arts and science departments returned to the Strand, while the household and social science department began separate existence on Campden Hill. *See* London, University of.

King's College. University of Nova Scotia, Canada, affiliated with Dalhousie College and university. It was established at Windsor in 1789, and received a charter in 1802. It provides education on Church of England lines. Its constitution was modified in 1853 and again in 1895, and it is affiliated to

Oxford, Cambridge, and Trinity College, Dublin. It is no longer confined to members of the Church of England, although it still specialises in theology. Degrees are given in arts, law, and science, which, with divinity, are the four schools. The

law school, founded in 1892, is at St. John's, New Brunswick. Women are admitted to the degrees and there are residential facilities for the students. In 1920 the buildings at Windsor were burned down, and in 1923 the university was removed to Halifax.

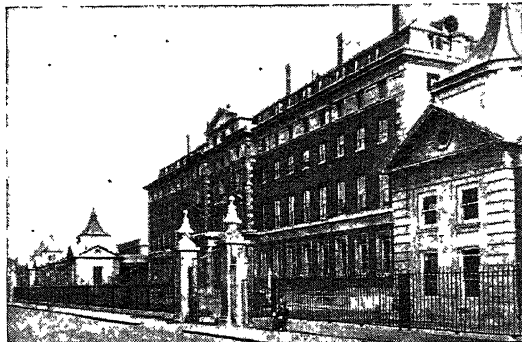
King's College Hospital. Institution in London. It was founded in connexion with King's College in 1839 with 120 beds. The original hospital was situated close to Clare Market, and in 1861 was replaced by a large building on the same site. The foundation stone of the present hospital at Denmark Hill was laid in 1909, and the new building was opened in 1913. In construction and equipment, the hospital is one of the finest in the metropolis. Its ultimate accommodation will be 1,000 beds. Lord Lister (*q.v.*) joined the staff in 1877, and here de-

separated from the college. It is divided into upper, middle, and junior schools, the upper having classical and modern sides. It is provided with laboratories and other modern accessories, and awards scholarships.

King's Counsel. In England members of the bar are appointed by the crown on the nomination of the lord chancellor, in Scotland on the recommendation of the lord justice-general. In fact, a K.C. renders no service to the crown, and since 1920 has needed no licence to appear against it. Formerly this licence was never refused, and was a matter of form. A K.C. wears a silk gown, and is thus frequently called a silk. He takes precedence over the junior or outer bar, and always sits within the bar of the court. A K.C. is not allowed, by the etiquette of the bar, to appear in a cause alone; he must have a junior barrister with him. The first of the rank was Francis Bacon. According to the sovereign's sex, such members of the bar are called king's or queen's counsel. The first two women K.C.s were appointed in 1949.

King's County. Former name of the inland county of Eire now known as Offaly (*q.v.*).

King's Cross. A district of London. It is in the bor. of St. Pancras, centering on the junction of Pancras, Euston, York, Caledonian, Pentonville, and Gray's Inn Roads. Formerly known as Battle Bridge, from a bridge which crossed the Fleet river and the traction that here was fought a battle between the forces of Suetinius Paulinus and those of Boadicea, it was renamed King's Cross in 1836, when a monument to George IV and William IV was erected. This was taken down 1845. King's



King's College Hospital, Denmark Hill. The building to which the hospital was transferred in 1913

veloped his principles of antiseptic surgery. *See* Hospital.

King's College School. English public school. It was founded in 1829, being the junior department of King's College, London. It remained part of the college in the Strand until 1897, when it was removed to new buildings at Wimbledon. Under the reorganization scheme of 1908 it was quite

King's Cross terminus of the old G.N.R. and later of the L.N.E.R. was built 1852 on the site of a smallpox hospital. Near by are the St. Pancras rly. terminus and the underground King's Cross and St. Pancras junction station.

King's Cup. British air race instituted in 1922. It was held annually until the Second Great War, and was confined to British aircraft and pilots. Racing was

on a handicap basis under the auspices of the Royal Aero Club. The rules for the King's Cup varied from year to year, but it became a two-day contest, with heats on the first day. The course was over a large area of Great Britain. Wintred Brown in 1930 was the only woman winner.

King's Evidence. In English law, name sometimes applied to an approver, i.e. a criminal who volunteers to give evidence against his accomplices. The evidence of such a person is to be received with suspicion, and a judge ought always to direct a jury that they are not to convict unless there is corroboration of his story. See Evidence.

King's Evil. An old name for scrofula. It is derived from the fact that at one time the touch of the king was supposed to cure this disease. Queen Anne was the last monarch who touched people for the king's evil. See Scrofula.

King's Flight. A unit of the R.A.F., formed for the use of the royal family. It was first established in 1936 and was reconstituted under the same leader, Air Cdre. E. H. Fielden, after the Second Great War. Its headquarters is at Benson, Oxon, but it was stationed in S. Africa during the royal visit of 1947.

Kingsford, ANNA (1846-88). British doctor and writer. She was born at Stratford, Essex, Sept. 16, 1846, and had been writing short stories for some years when, in 1872, she bought and edited *The Lady's Own Paper*, which she relinquished the following year. Shortly afterwards she went to Paris, where she studied medicine, taking her doctor's degree in 1880. She began to practise in London, publishing *The Perfect Way in Diet*, an advocacy of vegetarianism, in 1881, and became interested in theosophy. She was president of the Theosophical Society in 1883, and, with Edward Maitland, founded the Hermetic Society in 1884. She died Feb. 22, 1888.

Kingsford, WILLIAM (1819-98). Canadian historian. Born in the city of London, Dec. 23, 1819, he began to study architecture, but enlisted in the army and was sent with his regiment to Canada. Leaving the army, he first became

a journalist, then, after having occupied a position in a Montreal surveyor's office, took to engineering. Having done much work on the Grand Trunk and other rlys., he was, during 1872-79, engineer-in-charge of the harbours on the Great Lakes and St. Lawrence. Dismissed from his post in 1879 on the ground that it was no longer necessary, he devoted himself mainly to writing his great *History of Canada, 1887-98*. He also wrote *Impressions of the West and South, 1858*; *Canadian Archaeology, 1886*. He died Sept. 28, 1898.

Kingsford-Smith, SIR CHARLES EDWARD (1897-1935). Australian airman. Born at Brisbane, Feb. 9, 1897, he entered civil aviation in 1919, after war service in the R.F.C. and R.A.F. He piloted the Southern Cross on the first trans-Pacific flight, 1928, and made a record-breaking flight in the same machine from Australia to England in 1929. In 1930 he set up a new record of 10½ days for England to Australia, and in 1931 piloted the first all-Australian air mail back to England. Knighted in 1932, he disappeared over the Bay of Bengal when flying solo in Nov., 1935. His story, *My Flying Life*, appeared the next year.

King's Friends. Name given in the earlier part of the reign of George III to a party of politicians who acted under the direction, and in the interests, of the king. Almost every sovereign before George had had "friends" in the house of commons, but as an organized body of about 60 men they first appeared about 1763, and for some seven years they voted as the king ordered. With the advent to power of Lord North, who was more or less George's nominee, they became merged in the general body of his supporters. See George III.

King's Inns. Headquarters of the Irish bar, corresponding to the inns of court in London. The building, erected in 1800, is in Henrietta Street, Dublin, and the society possesses a valuable library. The benchers of the inn arrange for the examination of students, and their admission to the rank of barrister. The society dates from the 13th century, when Collett's Inn was founded. This was replaced after vicissitudes by Preston's Inn. In 1542 Henry VIII gave a monastery in Dublin for the use of the inn, which then took its present name. Before 1866, solicitors as well as barristers were pre-

pared for their careers at the King's Inn. See Barrister; Inns of Court.

Kingsland. District of N. London. It lies partly in the bor. of Shoreditch and partly in that of Hackney. Kingsland Road runs north from Shoreditch rly. station to Dalston Junction and Kingsland High Street. In the 18th century a hamlet of the parish of Islington, in the middle of the 19th century Kingsland consisted largely of brickfields, nurseries, and market gardens. John Pope in 1487 bequeathed money to found here a leper hospital, which became later a lock hospital in connexion with S. Bartholomew's Hospital. This was closed in 1761, but its chapel, at the S.E. corner of Ball's Pond Road, existed until the time of William IV. The Metropolitan Hospital (1836) is in Kingsland Road. The district is closely built over.

King's Langley. Village of Hertfordshire, England. Situated on the Gade, it is 5 m. N. of Watford and has a railway station. The name is derived from the fact that Henry III had a palace here. Richard II was first buried by Henry IV at King's Langley. Pop. 3,335.

Kingsley Dam. Hydro-electric and irrigation scheme in Nebraska, United States. Begun in 1936 and completed in 1941, the dam was built by the Works Progress Administration and is ¼ m. long with a maximum height of 162 ft. At completion it was the largest dam in the country except for that of Kentucky, and, stretching across the N. Platte valley, forms a reservoir impounding 88,000 million gallons of water. The water head is used to drive dynamos generating 730,000,000 kW. hours of electricity, while the reservoir irrigates 220,000 acres, the water being carried through 600 m. of canals and channels.

Kingsley, CHARLES (1819-75). British cleric, novelist, poet, and social reformer. Born at the



vicarage of Holne, Devon, June 12, 1819, he was educated at King's College, London, and Magdalen College, Cambridge. Having been ordained, he became rector of Eversley (q.v.), Hants, in 1844, and held the living

Charles Kingsley
Stereoscopic Co



Anna Kingsford,
British writer
Elliott & Fry

for the rest of his life, dying there Jan. 23, 1875. He was appointed professor of modern history at Cambridge in 1860, resigning 1869, and canon of Westminster in 1873.

Of lofty character and animated by a passionate sympathy with the poor and oppressed, Kingsley was drawn towards the movement of the Christian Socialists in which the leading figure was his friend, F. D. Maurice. His ideas found expression in two novels published in 1849, *Alton Locke*, and *Yeast*, in which are presented powerful pictures of the life of the London poor. His next novel, *Hypatia*, 1853, dealt with the conflict between Christianity and pagan philosophy in the 4th century. In 1855 appeared *Westward Ho!* (*q.v.*), Kingsley's best known and by many regarded as his best work, though biased. *Hereward the Wake*, 1866, is another novel with a fine romantic flavour, dealing with the heroic last struggles of the English against the Normans. The inimitable *Water Babies*, 1863, and *The Heroes*, 1856, will always be classics among children's books. In poetry, in which Kingsley began his literary career, his best work is to be found in his Ballads. Considered a radical churchman, he supported the Darwinians. In 1916 the novel *The Tutor's Story*, completed by his daughter, Lucas Malet, was first published.

Bibliography. C.K., *His Life and Letters*, F. E. Kingsley, 1877; Charles Kingsley, S. E. Baldwin, 1934; M. F. Thorp, 1937; C.K. and His Ideas, G. Kendall, 1947.

Kingsley, HENRY (1830-76). British novelist. Born at Barnack, Northants, Jan. 2, 1830, younger brother of Charles Kingsley, he left Oxford for the Australian goldfields, where he worked 1853-58. On his return to England he gave himself to literary and journalistic work, serving as a war correspondent during the Franco-Prussian War. Of his many novels the best are *Geoffrey Hamlyn*, 1859, and *Ravenshoe*, 1861. He died May 24, 1876. *A Life* by S. M. Ellis appeared in 1931.

Kingsley, MARY HENRIETTA (1862-1900). British traveller and author. Born in London, Oct. 13, 1862, the only daughter of G. H. Kingsley, and a niece of Charles,

she had marked scientific tastes, and after her father's death in 1892 she began to travel. She spent some time in perilous journeys in W. Africa, during which she acquired a mass of valuable information, and in 1897 published *Travels in W. Africa*. She had gone to S. Africa to nurse Boer prisoners when she died at Simon's Town, June 3, 1900. Her life was written by S. Gwynn, 1932.

King's Lynn, OR LYNN REGIS. Mun. bor., seaport, and market town of Norfolk, England. It is on the Great Ouse, near the Wash, and it is a railway junction.

S. Margaret's church includes part of a Benedictine priory, and was founded by Bishop Losinga (d. 1119); restored in 1875, it contains unique 14th century brasses. The chapel of S. Nicholas was restored in 1853; All Saints in 1887. In the Trinity Guildhall (1423), of black flint and white stone (*see Architecture illus. p. 572*), is preserved the ancient Red Register of Lynn. In the grammar school (since removed to Gaywood), successor to one founded in the time of Henry VIII, Eugene Aram (*q.v.*) was an usher when arrested in 1758 for the murder of Daniel Clark. Other features are the Grey Friars' steeple; the octagonal Rood or Red Mount chapel, 1485, once a resort of pilgrims to Walsingham; custom house, 1683; 15th century south gate; Corn Exchange, 1854.

Important in the time of the Conqueror, King's Lynn obtained its first charter in 1205, and the Hanse merchants had a warehouse here in the 15th century. In 1643, after four weeks' siege, it surrendered to the parliamentary forces. There is a good harbour, the first dock being opened in 1869. Industries include shipbuilding, iron and brass founding, ball bearings, rope and sail making, boot and shoe making, malting and brewing, and canning of sugar beet, fruit, and vegetables. As a port the town imports timber, coal, and oilcake, and exports corn. There are valuable fisheries. The council owns the baths, public library, museum, and art gallery. Market days, Tues and Sat. King's Lynn gives its name to a county constituency of Norfolk. Pop. est. 25,500.

King's Medal. Title of two decorations instituted by King

George VI in Aug., 1945, for award to Allied or other foreign subjects, mainly civilians, whose services furthered the British and Allied cause in the Second Great War. The King's Medal for Courage in the Cause of Freedom was granted for deeds performed at personal risk, and most awards were to members of resistance movements who helped British serving men to escape from or to evade the enemy. It is worn suspended from a white ribbon with broad red stripes at each edge, and in the centre two narrow blue stripes separated by a narrow white stripe.

The King's Medal for Service in the Cause of Freedom was bestowed first on Winthrop Aldrich for his work as president of the British War Relief Society of the U.S.A. It is worn suspended from a white ribbon with a narrow red stripe at the centre and a narrow blue stripe on each side. *See Medals, col. pl.*

King's Medal for Chiefs.

A medal instituted in 1920 by George V for award to native chiefs in British colonies and protectorates. It is of silver, bearing on the obverse the royal effigy, and on the reverse a merchant vessel plying under the protection of a ship of war outside a harbour illuminated by a tropical sun. A number of these medals were presented during George VI's tour of S. Africa in 1947.

King's Messenger. A name commonly applied to a member of the corps of King's Foreign Service Messengers. They are appointed by the Foreign Secretary, and their duties consist of carrying confidential bags between the foreign office and embassies, legations, and other posts abroad under that department. Recruited mainly from retired officers of the navy, army, and air force, they are supplied with a special diplomatic passport and a badge, the famous silver greyhound.

King's Norton. S. suburb and borough constituency of Birmingham, England. It has a railway station. King's Norton and Northfield formerly comprised an urban district of Worcestershire, which was almost entirely incorporated with Birmingham in 1912. The Worcester and Birmingham canal passes through a tunnel 2,750 yds. long at King's Norton. Here is an old church, S. Nicholas, restored in the 19th century, and an old schoolhouse. The industries include a large factory making small arms. The model village of Bournville (*q.v.*) is within the district. *See Birmingham.*



King's Lynn arms



Henry Kingsley

King Sound. Large indentation of N.W. Australia, in the Kimberley div. of W. Australia. It receives part of the drainage of the Oscar and Albert Edward ranges by the Fitzroy river. Derby is the chief place, near the head of the Sound. The Buccaneer Archipelago lies at the sea entrance, which is about 50 m. wide.

King's Pictures, THE. Name given to the collection of pictures acquired by various members of the English and British royal houses and now kept at Buckingham Palace, Windsor Castle, Hampton Court, as well as in certain public galleries. Chief contributors to the collection were Henry VIII, Charles I, George IV, and Albert, Prince Consort. Notable pictures include the series of portrait drawings by Holbein, court painter to Henry VIII, now in the Royal Library, Windsor; the Raphael cartoons for the Sistine chapel tapestries (purchased for Charles I by Rubens, and now on permanent loan to the Victoria and Albert museum, S. Kensington); many portraits by Van Dyck of Charles I and members of his court; Gainsborough portraits of George III and his family; magnificent landscapes by Canaletto; genre pictures by Dutch masters of the 17th cent. acquired by George IV; and fine works by Granach, Mabuse, Memlinc, Bellini, Durer, Giorgione, Veronese, Titian, Tintoretto, del Sarto, Correggio, Rubens, Rembrandt, Vermeer, Claude, Lely, Reynolds, Lawrence, Zoffany, Wilkie, and Stubbs. Charles I was one of the greatest art patrons of all times, but his vast collection was seized and dispersed under the Commonwealth, a considerable number of those sold abroad being eventually repurchased by Charles II. Over 500 of the king's pictures were shown in a unique exhibition at the Royal Academy in the winter of 1946-47. The office of Surveyor of the King's Pictures is in some ways parallel with that of the Master of the King's Musick.

King's Police and Fire Services Medal. Medal instituted by Edward VII in 1909 for award to police or fire brigade officers. Since 1933 there have been two distinct medals: for gallantry, and for distinguished service. The latter is awarded to police and fire brigade officers with a specially distinguished record in administrative service, or perhaps in organizing bodies, under special difficulties, dealing with widespread outbreaks of crime or

serious fire, or giving special services to royalty and heads of state. The gallantry medal goes to officers showing conspicuous bravery in saving life and property or in arresting criminals. Both medals are of silver and identical in design, bearing on the obverse the effigy of the reigning sovereign, and on the reverse an armed watchman leaning on a sword with a shield inscribed, "To guard my people," with a fortified city in the background. By amendments in 1930 and 1936, both medals were made available for award to fire and police officers of the dominions, colonies, and protectorates. The medal is worn suspended from a dark blue ribbon with edge and central stripes in white; the gallantry medal having a thin red line down each stripe. *See* Medals.

Kingsport. City of Tennessee, U.S.A. In Sullivan co., it is on the Holston River, in the South Appalachian Mts. Industrial installations include one of the world's largest book printing works, iron foundries, and a huge plant making cellulose acetate and its by-products. Other products include paper, textiles, rayon, plastics, chemicals, glass, cement, and bricks. A village with under 1,000 inhabitants in 1907, Kingsport was laid out as an industrial city in 1916. Pop. 14,404.

King's Printer. In Great Britain, the controller of H.M. Stationery Office. In him is vested by letters patent under the great seal the copyright in all government publications, and he is also the king's printer of Acts of Parliament. He controls all government printing contracts. He has central offices in London, Manchester, Edinburgh, and Cardiff. Eyre and Spottiswoode, Ltd., hold letters patent as king's printers of bibles and prayer books. The fact that a firm holds from the controller a contract to do government printing does not entitle it to make use of the term king's printer. *See* Stationery Office.

King's Prize. Rifle shooting competition held annually at the Bisley meeting of the National Rifle Association. It is open to British subjects who are serving or are past members of H.M. forces or those of any British-protected state. The competition is divided into three stages, by which the number of entrants is reduced to 100. The winner of the final stage (10 shots each at 300, 500, and 600 yds., and 15 shots each at 900 and 1,000 yds.) receives the prize of £250, together with the N.R.A.

gold medal and gold badge. Marjorie Foster in 1930 was the only woman winner. *See* Bisley.

King's Proctor (Lat. *procurator*, agent, deputy). In England, a legal official who acts on the public behalf, i.e. in the name of the crown, in the probate and divorce division, in the capacity of solicitor. He is best known as "intervening" in divorce suits, a duty imposed on the queen's (king's) proctor by an Act of 1860. If he is informed, before a decree has been made absolute, that the suit is collusive, or that the successful petitioner is, or has been, living in adultery, he intervenes on the application to make the decree absolute, and lays the facts before the court, with the result, as a rule, that the decree *nisi* is rescinded, and no divorce granted. Proctor has the same meaning as attorney, i.e. a person who manages such affairs, especially legal, as are delegated to him. *See* Divorce.

King's Regulations. Publication issued by the army council and amended monthly by army orders. It is the official guide to the administration of the land forces. The duties of commanders of all grades are detailed in these regulations; other sections cover conditions of service, procedure, discipline, and training. Officers are enjoined to "interpret them reasonably and intelligently," bearing in mind that "no attempt has been made to provide for necessary and self-evident exceptions." A similar publication is issued by the air council. (*See* Army, British; Discharge; Royal Air Force.)

A code of laws that governs the British navy is also entitled King's Regulations. It has grown through generations, and is being continually amended to suit modern needs. In this code the naval officer is provided with instructions for his guidance upon all service occasions. *See* Royal Navy.

King's Remembrancer. In England, a legal official. Originally he was one of the officials of the exchequer, his work being suggested by the name given to him. Like other exchequer officials, he had legal as well as financial duties. In 1859 the separate office was abolished, and the remembrancer was made a master of the court of exchequer. The judicial changes of 1873 made him a master of the supreme court, usually the senior master. *See* Exchequer.

King's Scout. First-class boy scout who has won three special badges in such subjects as forestry,

pioneering, camping, etc., and holds in addition the ambulance badge and three other badges for proficiency as fireman, interpreter, rescuer, pathfinder, etc. Scouts who pass these difficult tests receive a special certificate from the king. *See Boy Scouts.*

King's Speech. Name given to the speech with which in Great Britain the king opens each session of parliament. A somewhat similar address is delivered in the other parliaments of the British Empire, the king being represented by the governor-general. The speech, prepared by the king's ministers, outlines their programme of legislation for the coming session. It is addressed to the lords and commons, only the last paragraphs dealing with finance being addressed to the commons alone. The king usually reads the speech in person, although it is sometimes done by a deputy. The ceremony takes place in the house of lords, to which the "faithful commons" are summoned. *See Address to the Crown; Parliament.*

Kingston. City and seaport of Ontario, Canada. It stands at the eastern end of Lake Ontario, where the Cataraqui river falls into it, 175 m. S.W. of Montreal. It is served by the C.P.R. and C.N.R. The Rideau canal connects it with Ottawa. The chief buildings are the two cathedrals and several churches, Queen's university, and the Royal Military College. There are docks, whence steamers go to places on the lakes and on the St. Lawrence. Shipbuilding and engineering works are among the industries, and there are flour mills and grain elevators. One of the oldest places in Canada, Kingston arose round a fort built here by the French and known as Fort Frontenac. In 1758 the English took it, and in 1782 began to erect the present city, which they named in honour of George III. This was fortified, and during 1841-44 was the capital of Canada. Pop. 29,545.

Kingston. Capital and chief seaport of Jamaica. On the S.E. coast, in Surrey co., at the head of an excellent large landlocked harbour, it is the centre of the rlys. of the island, is strongly fortified, well built, lighted by electricity, and has electric tramways. The residential suburbs contain most of the official buildings. There are collegiate and



Kingston, Jamaica. Busy scene in the municipal market of this British West Indian seaport

philanthropic institutions, and an athenaeum, society of arts, theatre, and penitentiary. The climate is delightful by day, when the heat is tempered by sea breezes, but at night is damp and depressing. An extensive import and export trade is carried on. In the old church lie the remains of Admiral Benbow. Kingston was founded between 1693 and 1703, after an earthquake had ruined the neighbouring town of Port Royal (*q.v.*). It was made the capital in 1872. Subject to hurricanes and earthquakes, it was virtually destroyed in a few seconds by one of the latter, Jan. 14, 1907. Pop. 109,056.

Kingston. City of New York, U.S.A. The co. seat of Ulster co., it is on the W. bank of the Hudson, 53 m. S. of Albany. It is served by the West Shore and other rlys. and has steamer communication with Albany and New York. Formerly a busy port, it has declined industrially, but bricks and cement are manufactured, as are metal castings, clothing, refrigerators, and aeroplane parts. The old senate house, c. 1676, is one of the oldest public buildings in the U.S.A. Settled under the name of Esopus in 1653, the town was called Kingston in 1669. In 1777 it was burned by the English. It was incorporated in 1805 and became a city in 1872. Pop. 28,589.

Kingston. Town of Pennsylvania, U.S.A. Situated on the Susquehanna river 18 m. S.W. of Scranton, in Luzerne co., it is a mining centre and has rly. repair shops. Silk, hosiery,

and cigars are made. Here in 1778 occurred the battle of Wyoming when 300 men, women, and children of the settlement were killed during and after the conflict by a force of the local Iroquois Indians. The town was incorporated in 1858. Pop. 20,679.

Kingston-on-Soar. Village and

parish of Nottinghamshire, England. It stands on the Soar, near the borders of Derbyshire and Leicestershire, 10 m. S.S.W. of Nottingham, and has a railway station. Here, in the centre of a dairying district, is the Midland Agricultural and Dairy College, opened in 1900, and connected with Nottingham University. The church includes a chantry of the 15th century.

Kingston-upon-Hull. Official name of the city and co. bor. of Hull, East Yorks. *See Hull.*

Kingston - upon - Thames. Market town, royal and mun. borough of Surrey, England, and for some purposes the county town. Standing on the S. of the Thames, it is 12 m. S.W. of London. The borough includes Surbiton, Norbiton, and New Malden, being practically a suburb of London. It is served by electric railway, by the Green Line coach service, and by trolley buses. River steamers ply between here and Windsor, Oxford, and elsewhere. The principal



Kingston-upon-Thames arms



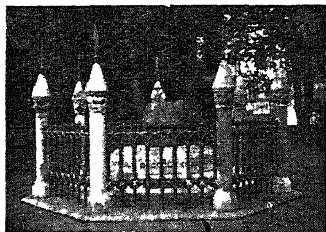
Kingston-upon-Thames, Surrey. Market place, beyond which are the town hall and the church of All Saints



Kingston, Jamaica, arms

building is the Perpendicular church of All Saints. The new guildhall was opened in 1935. Kingston Bridge was opened in 1828 and its width doubled in 1914. At the grammar school, now in a modern building although dating from at least 1264, Gibbon was a pupil. Galsworthy was born at Coombe and lived at Kingston Vale. The chief industries are flour mills, breweries, and oil refineries. The Kingston by-pass was one of the earliest motor roads of the type.

As the name suggests, Kingston has a long history. About 838 Egbert held a council here, and here in Anglo-Saxon times was a royal palace. In S. Mary's chapel, which fell down in 1730, seven early kings were crowned, and the coronation stone in the market



Kingston-upon-Thames, Surrey. The King's or Coronation Stone, now in the market place

place is a relic of that ceremony. The place was royal property at the time of Domesday, and soon became a corporate town, having a merchant guild. In the 14th century it sent two members to parliament; it now elects one. It is governed by a mayor and corporation. Market day, Thurs. Pop. 39,880.

Kingston, WILLIAM HENRY GILES (1814-80). British writer for boys. Born in London, Feb. 28, 1814, he was brought up largely at Oporto, where his father was in business. He went into business in London, but in 1851 achieved such a signal success with Peter the Whaler that he devoted himself to writing nearly 150 similar books for boys, notably the series, *The Three Midshipmen*, *The Three Lieutenants*, *The Three Commanders*, and *The Three Admirals*. He died at Willesden, Aug. 5, 1880.

Kingstown. The seaport of Dublin is officially known as Dun Laoghaire (*q.v.*).

Kingstown. Seaport and capital of St. Vincent, Windward Islands. Standing on Kingstown harbour, on the S.W. coast at the foot of Mt. St. Andrew, it exports rum, sugar, cocoa, spices, and



Kingstown, St. Vincent, Windward Islands. General view of the town and harbour on the Caribbean Sea, from the south

arrowroot. It is lighted by electricity. Pop. 4,269.

Kingsway. London thoroughfare connecting Holborn with Aldwych. In 1897 the congested region of Clare Market and Holywell Street was cleared, and in their place Kingsway and Aldwych were laid out. The Holborn Restaurant stands at the N.W. end while Bush House is in full view as one walks S. The Stoll Theatre, and Kingsway Hall, headquarters of the West London Methodist Mission, are in this thoroughfare. The Kingsway Theatre is off to the W., in Great Queen Street. See Aldwych.

Kingswear. Village of Devon, England. At the mouth of the Dart, on the E. bank, it stands opposite Dartmouth and is connected therewith by ferry. Its rly. station is the terminus for Dartmouth. In the restored church is a 14th century font; the tower is older. Pop. 809.

Kingswinford. A district of Staffordshire, England. It is 3½ m. N. of Stourbridge, and about the same W. of Dudley, and consists of two ecclesiastical districts — S. Mary's and Holy Trinity. Standing on a coalfield, its chief industries are coal and iron mining and the manufacture of iron goods, bricks, glass, etc. The name is due to the fact that times it was the king's property. Until 1950 it gave its name to a co. parl. div. with electorate 68,728.

Kingswood. Urban dist. of Gloucestershire, England. It is 3½ m. from Bristol, of which it is practically a suburb, on the site where the first open-air sermon was preached by Wesley. Boots and shoes are

made, and in the neighbourhood are coal mines. Pop. 18,000. The district around was once known as Kingswood Royal Forest. There is another Kingswood in the county, a village 1 m. from Wotton-under-Edge with an old church, S. Mary's; in the Middle Ages there was a Cistercian monastery here.

King-te-chen OR CHING-TE. Town of China, in the prov. of Kiang-si. It stands on a tributary of the Yang-tse, about 95 m. N.E. of Nanchang. Its port is Kiukiang on the Yang-tse. It is noted for the imperial porcelain factories, established 1004. Pop. 600,000.

Kingussie. Town of Inverness-shire, Scotland. It stands on the left bank of the Spey, 46 m. S. of Inverness, and has a railway station. It is the principal place in the Badenoch district and is a popular summer resort. Pop. 2,363.

King William Island. Large island of British N. America. It lies S.W. of Boothia, E. of Victoria Strait, and is separated from the mainland by Simpson Strait.

King William Land. Name of that part of N.E. Greenland lying S. of Germania Land. Its coastline is indented by Dove Bay, and several islands, including Koldey and Shannon, lie off its shores.

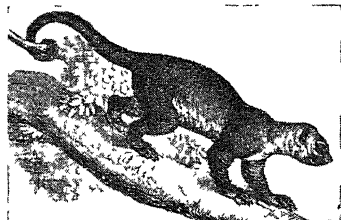
King William's Town. Town of the Cape Province, S. Africa. It stands on the river Buffalo, 37 m.



King William's Town, Cape Province. Government offices in this attractive South African town
Courtesy of South African Railways

W. of East London, being on the rly. In a pastoral district, it supplies the wants of farmers, and makes vehicles, furniture, leather goods, candles, and soap. It was founded as a mission station in 1825, being later named after William IV, and is known usually as King. European pop. 6,165.

Kinkajou (*Cercoptes caudivolutus*). Small carnivorous mammal of the racoon family. Found in Central and tropical S. America, it is long and catlike in body, and has a remarkably long prehensile tail by which it can support its weight when hanging from a branch. Its



Kinkajou. Small South American racoon with a long prehensile tail

soft fur is yellowish brown in colour, and its size is that of a small domestic cat.

Kinloch-Cooke, SIR CLEMENT (1854-1944). A British journalist and politician. Educated at Brighton and S. John's College, Cambridge, he was called to the bar in 1883, and became editor of *The English Illustrated Magazine*, *Observer*, *Pall Mall Gazette*, and *Empire Review*, founding the last named in 1901. He was Unionist M.P. for Devonport 1910-23, and for East Cardiff 1924-29. He wrote a life of Queen Mary. Knighted 1905 and made a baronet 1926, he died Sept. 4, 1944.

Kinlochleven. Industrial town of Argyllshire, Scotland. Beautifully placed at the E. extremity of Loch Leven, with Ben Nevis to N. and Glencoe to S., it presents an odd aspect of aluminium works and red-roofed dwellings. The road to Ballachulish, 8 m. W., was built by German prisoners of the First Great War.

Kinning Park. District of Glasgow, Scotland. It stands on the left bank of the Clyde, and is industrialised with engineering works and manufactures of soap and biscuits. It was a small village until the 19th century, when it was drawn into the industrial life of Glasgow. In 1905 it was incorporated with the city.

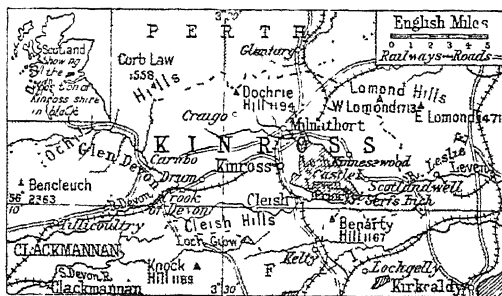
Kinnoull, EARL OF. A Scottish title borne since 1633 by the family of Hay. Sir George Hay, lord high chancellor of Scotland 1622-34,

was made a baron in 1627 and an earl in 1633. William, 4th earl, was prominent as a royalist during the Civil War; and on the death of the 5th earl there was no heir nearer than the descendants of the 1st earl's brother. One of these, Thomas, succeeded as 7th earl, and his son George was made a British peer as Baron Hay in 1711. From him is descended Arthur the 15th earl (b. 1935, succeeded 1938). Balhousie Castle, Perth, is the chief seat of the family.

Kino. Astringent gum, used in medicine, tanning, and dyeing. Indian kino, which was formerly that of the pharmacopoeia, is obtained by incisions in the bark of *Pterocarpus marsupium*, an Indian tree of the family Leguminosae. Another species, *P. erinaceus*, affords African kino, so named from the country of its origin. Bengal kino is a similar material obtained from a tree of the same family, the dhak (*Butea frondosa*). Kino is brittle, has a dark red colour, and is soluble in alcohol.

Kinross. A burgh of Kinross-shire, Scotland, also the county town. It stands on the W. side of Loch Leven, and has a railway station. It has manufactures of woollen and linen goods. The town was a royal residence in the 13th century. Pop. 2,525.

Kinross-shire. A county of Scotland, the smallest in the country save Clackmannanshire. With an area of 82 sq. m., it lies between Fife and Perthshire. The surface is generally level with a fringe of hills. Loch Leven is in the county, which has several small rivers—one, the Devon, dividing it from



Kinross-shire. Map of the county, which is, save Clackmannan, the smallest in Scotland

Perthshire. Much of the soil is under cultivation, and cattle and sheep are reared. Railways serving the county converge on Kinross, the co. town; Milnathort is the only other town. Before the 13th century the county formed part of Fife. It unites with one of the divisions of Perthshire to elect an M.P. Pop. est. 7,700.

Its literary associations centre mostly in Loch Leven, and begin with Andrew of Kinross-shire arms Wyntoun, prior (1395) of S. Serf's Inch, who wrote *The Original Chronicle of Scotland*. The castle of Leven was in 1567 the prison of Mary Queen of Scots. At Kinnesswood was born Michael Bruce (1746-67), believed to have written the *Ode to the Cuckoo* generally attributed to John Logan.

Kinsale. Seaport, urban district, and watering place of co. Cork, Eire. It stands at the head of Kinsale Harbour, 24 m. S. of Cork on the Eire State rlys. It is a fishing centre. The Spaniards landed here in order to assist the Irish in 1601. In 1689 James II landed with a French army. The harbour is formed by the estuary of the Bandon river and extends for 2 m. On the E. side is a lighthouse. The old head of Kinsale is a headland of co. Cork; it forms the extremity of Courtmacsherry Bay. Off Kinsale the *Lusitania* was sunk, May 7, 1915. Market day, Fri. Pop. 2,086.

Kinshasa, OR KINSHASSA. River port of the Belgian Congo. On Stanley Pool close to Léopoldville, it is connected by a railway with Matadi.



Kinsale, co. Cork, Eire. View of the harbour and the town's fishing fleet

Kinship. Term employed in social anthropology in several senses. In its strictest meaning of physical relationship it is synonymous with consanguinity. This relationship, real or theoretical, as by adoption, is in practice limited, and kin is thus more restricted than kind. Some writers use the term of a group embracing a person's relatives on the father's or the mother's side only. The totality of his physical lineage is not ignored, but he acquires special rights, duties, and restrictions towards the dominant group. Thus, in an exogamous clan set up on the principle of matrilineal descent, a man is kin to his mother's sister's husband, but not to his father's brother's wife, and marriage within his own kinship-group, however defined, would be deemed incest. A third sense, purely conventional, denotes the rights and duties incidental to membership of a local group.

Much has been written from the standpoint that the terms of relationship in a language are either classificatory or descriptive. By the former is implied that a man regards all women within his group of his own generation as sisters, and all men of his father's generation as fathers or uncles. *See* Family; Inheritance; Primogeniture; Society.

Kintyre or **CANTYRE.** Peninsula forming the extreme S. of Argyllshire, Scotland. Lying between Kilbrannan Sound and the Atlantic Ocean, it is connected with Knapdale on the N. by the Isthmus of Tarbert, length 38 m., average breadth 7 m. On the Mull of Kintyre stands a lighthouse with a fixed light visible for 24 m. The Irish coast is 13 m. S.W. of the Mull.

Kioga. This lake of Uganda is also spelt Choga (*q.v.*).

Kiosk (Turk. *kiushk*). Open summerhouse or pavilion common in Turkey and Persia. It is formed of a roof of wood or straw supported upon light pillars surrounded by a balustrade. The size varies from a little shelter to a banqueting hall. In a broader sense the word is now applied to any small dépôt or shelter, such as is used for the sale of newspapers, tobacco, etc. Newspaper kiosks are a familiar feature of the Paris streets. London's

public telephone kiosks date from 1912; since 1921 they have been designed by Sir Giles Gilbert Scott, and the model introduced in 1935 is officially termed the jubilee kiosk. In both Great Wars kiosks were erected in London for the distribution of essential war information. *See* Information Bureau.

Kipchak. Term for a nomad people of Altaian stock, nowadays almost confined to the old province of Ferghana, in Uzbek S.S.R. They are Muslims descended from the middle horde of the Kirghiz-Kazak, and represent the White Horde which flourished in the 13th-14th centuries until disintegrated by Tamerlane. The Golden Horde, or W. Kipchak, which under Jenghiz Khan's son Batu dominated the region east of the Don, became the Kazan Tartars. *See* Mongol.

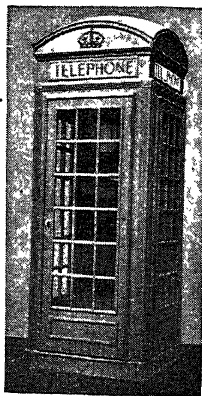
Kipling, RUDYARD (1865-1936). British poet and writer, particularly of short stories. He was born in Bombay, Dec. 30, 1865, his father John Lockwood Kipling, being at that time professor of architectural sculpture in the Bombay school of art (later becoming curator of the government museum, Lahore). His mother was a sister of Lady Burne-Jones, Lady Poynter, and Mrs. Alfred Baldwin, mother of the 1st Earl Baldwin. After being sent to England in 1871, young Kipling was educated at the United Services College, Westward Ho!, N. Devon, elaborately described in *Stalky and Co.*, in which the author figures as "Beetle." Returning to India in 1882, he was engaged until 1889 in journalistic work for various periodicals, and his earliest short stories were published during this period, as was his first characteristic book of verse, *Departmental Ditties*, 1886. Many volumes of stories were rapidly issued in Wheeler's Indian Railway Library: *Plain Tales from the Hills*, 1887; *Soldiers Three*, 1888; *In Black and White*, 1888; *The Story of the Gadsbys*, 1888; *The Phantom Rickshaw*, 1888; *Wee Willie Winkie*, 1889. He then made an extensive tour through the East and America to England, where his stories soon enjoyed a great vogue. To the general reader their glowing glimpses of life in India, especi-

ally as lived by the military and governing classes, were a revelation. His work was paid the compliment of serious analysis by several leading critics, although then and thenceforward he himself avoided all literary cliques and was never without his detractors. At the same high speed he published *Life's Handicap*, 1890; *The Light That Failed* (his only full-scale novel), 1891; *Barack-room Ballads* (verse), 1892; *Many Inventions*, 1893.

In 1892 Kipling married a sister of Wolcott Balestier, the American writer with whom he had collaborated in a "thriller," *The Naulakha*, 1891. With his bride he set out on another world tour, but the failure of a bank necessitated a halt in America, where he resided (at Brattlebois, Vermont) for some years. There he wrote the two *Jungle Books*, 1894-95; *The Seven Seas* (verse), 1896; *Captains Courageous*, 1897. Returning to England in time for the Diamond Jubilee of 1897 he aroused admiration with his poem *Recessional*, first published in *The Times*. He was now at the peak of his popularity, the sentiment of his verses suiting to a nicety the imperialist mood of the hour. Further books of this period are *The Day's Work*, 1898; *Stalky and Co.*, 1899.

The Mature Kipling

In 1899, when he lay at the point of death in a New York hospital, the whole world seemed to be waiting in suspense. He recovered; but the almost simultaneous loss of his favourite daughter clouded his first exuberance, and his work thereafter had a different note, in some ways more mellow. In the picturesque *Kim*, 1901, he bade farewell to the India which had served him so well. Gradually he discovered a new theme based on a deep love of England and of the English soil as a palimpsest of history. This was already evident in the genial children's book, *Just-So Stories*, 1902, but reached full development with *Puck of Pook's Hill*, 1906, and its companion volume, *Rewards and Fairies*, 1910, as well as in such short stories as *An Habitation Enforced*, included in *Actions and Reactions*, 1909. Meanwhile *The Five Nations*, 1903, consisted mainly of verses prompted by the South African war, the disillusionments of which also left their mark upon his outlook. The verses included the famous stricture on "the flannelled fool



Kiosk. G.P.O. public telephone kiosk

at the wicket and the muddled oaf at the goal," which temporarily aroused much anger. During the war he edited a newspaper for the troops in South Africa, and subsequently for several years he made, with his family, an annual visit to the new dominion. *Traffics and Discoveries* was published in 1904, and in 1905 he began to support Lord Roberts on the question of national military service.

He then settled down to live a somewhat exclusive life at Burwash, in the heart of Sussex. His only son, John, an officer in the Irish Guards, was killed at Loos, 1915. The pace of output became much slower. Though new stories and verses appeared occasionally in the magazines, their collection into volumes became rare literary events. By the time he died a generation had grown up to whom his name meant little. Obituary notices from his fellow writers occupied far less space than they would have done twenty years earlier. Later books included *A Diversity of Creatures*, 1917; *The Years Between* (verse), 1919; *Debits and Credits*, 1926; *Limits and Renewals*, 1932; and the autobiography, *Something of Myself*, published posthumously, 1937. Minor publications include *From Sea to Sea*, 1899; various impressions of the army and navy during the First Great War; *Letters of Travel*, 1920; *Land and Sea Tales for Scouts and Guides*, 1923; *Souvenirs of France*, 1933. He edited *The Irish Guards in the Great War*, 1923; and collaborated with C. R. L. Fletcher in a *History of England*, 1911. He also wrote two plays, neither of which was successful.

Kipling was rector of St. Andrews university 1922-25. He received honours from the universities of Oxford, Cambridge, Durham, Edinburgh, McGill, Paris, Strasbourg, and Athens. In 1907 he was awarded the Nobel prize for literature, and in 1926 received the gold medal of the Royal Society of Literature, an honour previously given only to Scott, Meredith, and Hardy. At one time he was offered the O.M., but declined. It was Kipling who chose for the Imperial War Graves Commission the words, "Their Name liveth for evermore," as a motto for war cemeteries and memorials. Kipling died Jan. 18, 1936, and was buried in the Poets' Corner, Westminster Abbey.

From first to last he remained a superb literary craftsman, with a prose style so individual and so

consistent that apart from choice of subject matter there is little to distinguish a story written in 1890 from one written in 1930, yet the authorship of both is unmistakable. As revealed in his *Something of Myself*, this style, tense and firm, was partly the result of painstaking yet ruthless elimination of every inessential word. If derivative at all, it



Rudyard Kipling

Hoppé

was from the prose of the Authorised Version of the O.T. His verse was often more pretentious, less disciplined, much of it founded on the easy jingle of the ballad; but in the volume of *Inclusive Verse* (1919, with later editions containing additional works) can be found much that is forceful and unforgettable in the way of phraseology, and a great deal that is of monumental dignity, besides several glimpses of undoubted beauty, as in *The Way Through the Woods*.

Some of his verses have proved popular as songs, e.g. *Boots*, and *Mandalay*; and the poem *If*, written in memory of Sir Starr Jameson, is in many anthologies.

His work has been assailed somewhat unfairly on the ground of vulgarity; with more justice for his occasional lapses from good taste; for his odd delight in physical violence; for the fourth-form horseplay of his humorous stories; and, above all, for his habit of making his favourite

characters very knowing and successful, and equally for his own "knowingness," or journalistic suggestion of omniscience. This trick, deliberately cultivated and often amusing in his earlier stories, was partly the expression of a genuine love of technical jargon; but in his later work the technicalities tended to become so obscure that he frequently seemed to be indulging in private jokes at the expense of his less knowledgeable readers. Nowhere is this habit more pronounced than in his stories with a masonic background, which are deliberately addressed over the heads of the uninitiated. Kipling's "imperialist" attitude and his theme of "the white man's burden" was also received with some distaste in certain circles, and there is no doubt that many have allowed a lack of sympathy with his politics to blind them to his great achievement as artist and craftsman.

Nevertheless, one answer to denigrating critics is found in the immense sales of all his books, steadily maintained throughout his life and since. Tens of thousands have revelled and continue to revel in Kipling, and are ready to forgive much for the sake of great story-telling. The Kipling Society, founded 1927, has headquarters at 105, Gower Street, London, W.C.1.

Gordon Stowell

Bibliography. Rudyard Kipling, a Criticism, R. le Gallienne, 1900; Kipling Dictionary, W. A. Young, 1911; Handbook to the Poetry of R. K., R. Durand, 1914; R. K., C. Falls, 1915; *The Less Familiar Kipling and Kiplingana*, G. F. Monkshood, 1917; R. K., the Story of a Genius, R. T. Hopkins, 1930; *Schooldays with Kipling*, G. C. Beresford (M'Turk, of Stalky and Co.), 1936; R. K., Craftsman, Sir G. MacMunn, 1938; R. K., a New Appreciation, Hilton Brown, 1945.

Kipper. Term used for a hering that has been cured by smoking. It meant originally a male salmon, and was applied to that fish after it had been dried and cured. Later it was used for



Kipling. Bateman's, Burwash, Sussex, Kipling's home 1902-36, left to the nation by his widow

other fish treated in the same way, especially the herring. See *Fish Curing*; *Herring*.

Kipps. Novel by H. G. Wells, published in 1905, with the subtitle *The Story of a Simple Soul*. The hero is a humble draper's assistant, Arthur Kipps, who unexpectedly inherits a fortune and embarks upon misadventures in the more snobbish circle of Folkestone society. Although he very nearly marries into that circle, he eventually runs away from it to marry his first love, a parlour-maid, loses his money, and fortuitously acquires sufficient new riches to ensure a happy ending to the story. Told with great zest and humour, the book also presents a shrewd social commentary, and Kipps himself is an outstandingly lovable character. Two film versions were made, the first (silent) in 1921, with George K. Arthur, the second in 1941, with Michael Redgrave, Diana Wynyard, and Phyllis Calvert.

Kiprensky, OREST ADAMOVITCH (1783-1836). A Russian painter. Born near Oranienbaum, March 13, 1783, he studied at the St. Petersburg academy, afterwards perfecting his technique in France and Italy. His most characteristic works include portraits of himself and Thorvaldsen, studies of the Madonna, and certain genre pictures, such as *The Young Gardener* and *Young Spaniard in the Costume of the 17th century*. He died in Rome, Oct. 5, 1836.

Kirby, WILLIAM (1759-1850). A British entomologist. Born at Witleham, Suffolk, Sept. 19, 1759, and educated at Ipswich and Caius College, Cambridge, he took orders and from 1796 was rector of Barham, in his native county, until he died, July 4, 1850. His first published work was a monograph of the British bees, 1802, but he is best known by *An Introduction to Entomology* (with William Spence), 1815-26, long the standard work on the subject. He also wrote the *Bridgewater treatise on the History, Habits, and Instincts of Animals*, 1835.

Kirchhoff, GUSTAV ROBERT (1824-87). A German physicist. Born March 12, 1824, at Königsberg (now Kaliningrad), he studied mathematics there and at Berlin. In 1874 he became professor of physics and mathematics at Berlin university. He did important work on the theory of the conduction of heat, and in optics, electricity, and acoustics. While at Heidelberg in 1859, working in cooperation with Robert Bunsen,

he discovered the spectroscope and laid the foundation of spectrum analysis in Kirchhoff's Law on the relation of emission and absorption. He was still working in Berlin when he died Oct. 17, 1887.

Kirchhoff's Laws. In electricity, (1) the algebraic sum of the electric currents meeting at any point in a network of conductors is zero; (2) the algebraic sum of the electromotive forces in any closed circuit or mesh is equal to the algebraic sum of the products of the resistances of each part of the circuit and the respective currents flowing through them.

In radiation, at any given temperature the ratio of the emissive power of any body for any wavelength to its absorbing power for the same wavelength that that temperature is constant, and is equal to the emissive power of a perfectly black body at the same temperature.

Kirghiz. Originally mounted nomads of Altaian stock, mostly in central Asia, numbering perhaps 4,000,000, with about 250,000 on the N. Astrakhan steppes. One-eighth of them comprise the true or Kara-Kirghiz—black-capped—of the Pamir and Tian Shan highlands. The rounder-headed, more Mongoloid, steppe-dwelling Kazak riders are called by the Russians Kirghiz-Kazak to distinguish them from the lowland Slav Cossacks. Essentially herdsmen, they often cover 2,000 m. in their annual migrations. Of Turkic speech, their lax Mahomedanism, lacking mosques and mullahs, is tinged with aboriginal shamanism (*q.v.*).

Kirghiz OR KIRGHIZIA. Constituent republic of the U.S.S.R. Situated among



Kirghiz. Type of this nomadic race

Peaks up to 16,000 ft. cover a large part of the republic, whose principal rivers are the Chu and Naryn. There are excellent pastures on the mts., where cattle, sheep, goats, and horses are reared, the republic being famed for livestock. Wheat, barley, and lucerne are cultivated

not only in the valleys. Irrigation extends the area under cultivation, and in 1946 the construction of a large canal was begun in the W. Sugar beet, tobacco, and hemp are grown; apple, plum, and apricot trees abound; and the hips of wild rose bushes yield vitamin C.

Gold, silver, tungsten, mercury, antimony, and arsenic are produced. There are sugar refineries, tanneries, flour mills, textile works, oil wells, and coal mines. Rlys. make use of the valleys. Besides elementary and secondary schools, there are technical and teachers' training colleges and music and art schools. A new alphabet based on Russian was introduced in 1940. Two-thirds of the pop. of 1,459,301 are Kirghiz (*v.s.*) the remainder being Russians, Ukrainians, and Uzbeks.

After the establishment of the Soviet regime, Kirghizia formed part of Soviet Turkestan, which became an A.S.S.R. in 1921. Detached in 1924, Kirghizia formed an autonomous region within the R.S.F.S.R. In 1926 it was promoted to an A.S.S.R., being proclaimed a constituent republic in 1936. Consult *Soviet Asia*, R. A. Davies and A. J. Steiger, 1943.

Kirin. One of the nine N.E. provinces of China. Kirin covers 34,616 sq. m., and contains 20 counties with Changchun as its capital. Between 1932 and 1945 this city was known as Hsinking, capital of the Japanese puppet state of Manchukuo. Changchun is the natural centre of the N.E. and headquarters of the rly. system. Other important cities are Kirin and Chaoyang. The Sungari is the principal river. Products of the prov. are soya bean, various minerals, including coal and iron, and timber. The E. border adjoins the U.S.S.R. Owing to its propinquity to Harbin and Vladivostok, the territory offers advantages to ocean traders. Pop. 5,122,000.

Kirin. A city of Kirin prov., Manchuria. It is on the navigable river Sungari and is connected with the trans-continental rly. system running through Harbin and Mukden at Changchun, 80 m. to the W. It has the finest buildings in Manchuria, constructed from the inexhaustible supply of timber brought down the river. Pop. 138,910.

Kirjath OR KIRJATH-JEARIM (Heb., city of woods). Town to the N. of the land of Judah, near Beth-Shemesh. Here the Ark of the Covenant was kept for some

years till provision could be made for it in Jerusalem (2 Sam. 6: 1 Chron., 13).

Kirjath OR **KIRJATH-SEPPER** (Heb., city of the book). Older name for the Canaanitish town of Debir (*q.v.*).

Kirk (Gr. *kyriakon*). The name given, chiefly in Scotland, to a church. In a general sense it is a Northern English and Scottish form of the word church, and still exists in dialect use, and as a popular designation. More particularly, kirk, in official use, was the name given to the Church of Scotland before the Westminster Assembly (1643). Afterwards it was usually given to that Church as distinguished from the Church of England, R.C. Church, and the Scottish Episcopal Church. The name long survived in Scotland, where the established church was referred to as the Auld Kirk as opposed to the Free Kirk (Free Church of Scotland).

Kirk session in Scottish eccles. law is the lowest church court in the Church of Scotland. It consists of the minister, who is called the moderator, and laymen known as elders, the elder responsible for summoning the court, keeping its minutes, and generally acting as secretary, being called the session clerk. A similar court, the session, exists in the United Free Church and in the Presbyterian Church of England. See Presbyterianism; Scotland, Church of.

Kirk, Sir John (1832-1922). A British administrator. Born near Arbroath, Dec. 19, 1832, he graduated in medicine at Edinburgh. During the Crimean War he served on the medical staff in Turkey. In 1858 he accompanied Livingstone on his second expedition to Africa. Kirk in 1866 was attached to the political mission at Zanzibar, becoming consul-general in 1873. Winning the sultan's friendship, he helped to abolish the organized Arab slave trade. Kirk represented British interests at the partition of East Africa with Germany in 1886. He was founder and director of the British East Africa Co.; his country's delegate in 1889 to the Brussels conference on the slave trade; and commissioner to the Niger Coast, 1895. Knighted in 1881, he died Jan. 15, 1922. Consult Kirk on the Zambesi, R. Coupland, 1929.

Kirk, Sir John (1847-1922). A British philanthropist. Born at Kegworth, Leics, June 10, 1847, he was educated at Castle Donnington grammar school. In 1873 he



Sir John Kirk,
British philan-
thropist

was made assistant secretary of the Ragged School Union, and in 1879 became secretary. For over 40 years, the latter part as treasurer, he was associated with this movement. Knighted in 1907, he died April 3, 1922. See Ragged School; Shaftesbury Society.

Kirkby. A word frequently found as part of English place-names, especially in the N. of England. It means a church (or kirk), town or village. Examples follow. Kendal (*q.v.*) is in full Kirkby-in-Kendal.

Kirkby-in-Ashfield. An urban district of Notts, England. It is 12 m. N.N.W. of Nottingham, in the L.M. rly. region, served by two lines. S. Wilfrid's is the principal church. The chief industry is coal mining. Pop. 18,500.

Kirkby Lonsdale. Parish and market town of Westmorland, England. It is on the Lune, 12 m. S.E. of Kendal, with a rly. station (L.M. region). S. Mary's church is a fine old building restored in the 19th century, and there are a 16th century grammar school, a market house, and an institute. A bridge, first erected in the 14th century, crosses the river. Kirkby is the Lowton of Jane Eyre, and near is Cowan Bridge, where Charlotte Brontë was at school. Pop. 1,370.

Kirkby Moorside OR **KIRBY MOORSIDE.** Market town of the N. Riding of Yorkshire, England. It is on the Dove, 20 m. S.W. of Whitby, with a rly. station (N.E. region). In the vale of Picking, with moors around, it is an agricultural centre. Agricultural implements are made, and there are ironstone mines near. There is an old church, All Saints, and near the town was a Cistercian nunnery. Market day, Wed. Pop. 1,950.

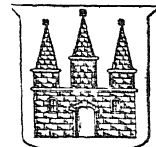
Kirkby Stephen. A market town of Westmorland, England. It stands on the Eden, 10 m. S.E. of Appleby, and has two railway stations about 2 m. apart.

It has an old grammar school and an old church, popularly

called S. Stephen's. It is an agricultural centre, having several annual fairs, and there are remains of lead, iron, and copper mines near. Limestone is extensively quarried. Pop. 1,588.

Kirkcaldy. Royal and police burgh and seaport of Fife, Scotland. On the Firth of Forth, it is 26 m. N. of Edinburgh, and has a railway station. The chief buildings include the Gothic parish church, the town hall, and the corn exchange. Beveridge Park and Beveridge Hall commemorate a benefactor; another public hall bears the name of Adam Smith, who was born here. Robert Adam was also a native. There is a free library; the grammar school was founded in 1532.

The port of Kirkcaldy has a good harbour with docks, wharves, etc., including a new dock built in the 20th century. The industries include the manufacture of linoleum and oilcloth, flax, paper, and



Kirkcaldy arms



Kirkcaldy, Fife. Front of the Adam Smith hall

flour mills, also dyeing, bleaching, spinning, and tanning.

In 1450 Kirkcaldy was made a royal burgh, and soon became one of the most flourishing of Scottish seaports. It had previously belonged to the abbey of Dunfermline. Because of the length of its main street, 4 m., it is known as the "lang toon." The burgh now includes Invertel, Linktown, Abbotshall, Gallatown, Sinclairtown, Pathhead, and Dysart. Kirkcaldy Burghs returns one member to parliament. Pop. est. 46,600; eighth in Scotland. Pron. Ker-koddy.

Kirkcaldy, Sir William (c. 1520-73). A Scottish politician, known as Kirkcaldy of Grange. He was the eldest son of Sir James Kirkcaldy, of Fife, who was lord high treasurer of Scotland 1537-43, and a determined opponent to Cardinal Beaton. William was

implicated, in 1546, with his father, in the murder of Cardinal Beaton, after which he was a prisoner



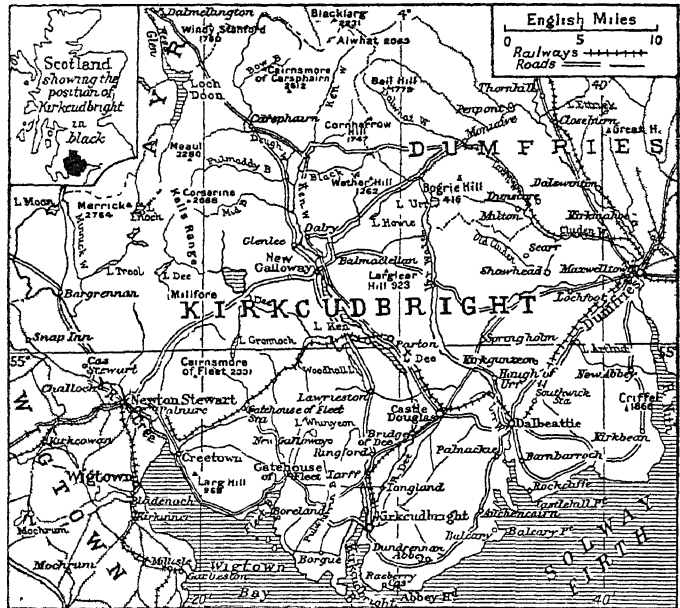
Sir W. Kirkcaldy,
Scottish politician

in France, the French, who came to the assistance of the Scots, having taken him back with them. Taking service with the French, he fought with distinction.

In 1537 Kirkcaldy returned to Scotland and as a Protestant leader was prominent during the next twelve years. He was at first one of the most persistent of Mary's enemies, objecting to her marriage both to Darnley and to Bothwell, and fighting against her at Langside, but about 1570 he changed sides. He defended Edinburgh Castle until its surrender in June, 1573. He was then taken and hanged, Aug. 3, 1573.

Kirkcudbright. Royal and mun. burgh and co. town of Kirkcudbrightshire, Scotland. It stands at the mouth of the Dee, on its left bank, 30 m. by railway S.W. of Dumfries. The church of S. Cuthbert dates from the 12th cent., and among the town's antiquities are the ruins of the castle erected by Sir T. Maclellan of Bombie, and traces of the ancient castle of the lords of Galloway. The harbour, formed by Kirkcudbright Bay, is the largest and safest in the south of Scotland. Market day, Friday. Pop. 2,311. Pron. Kirkcobree.

Kirkcudbrightshire. Co. of Scotland. In the S.W. of the country, it is in the co. constitu-



Kirkcudbrightshire, S.W. county of Scotland, famous for its Galloway cattle

ency of Galloway, lying between the shires of Dumfries and Wigtown. Its area is 900 sq. m. It has a rocky coastline on the Solway. The surface, hilly in the S., becomes mountainous inland. Mt. Merrick, Cairnsmore, and other peaks are over 2,500 ft. high. The chief rivers are the Ken, Cree, Dee, and Urr. Of the lakes the largest are lochs Doon, Dee, and Ken. Wigtown Bay is the largest inlet; another is the mouth of the Dee. The co. is famous for its cattle, the Galloway breed, and its sheep. Oats are grown and horses and pigs are reared. Works of the Galloway power scheme (see Hydro-electric Installations) are in the co. Kirkcudbright is the co. tn.

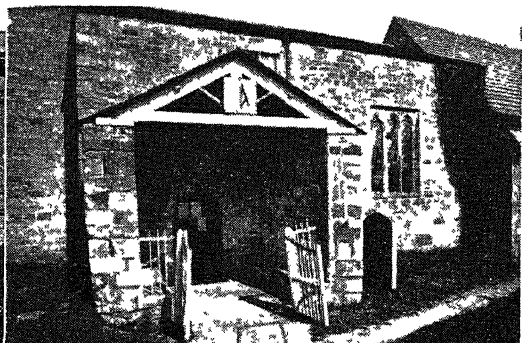
From very early times the shire was part of Galloway, which was virtually an independent kingdom.

But before 1200 it had been under the control of the Scottish kings, and later was the centre of the Douglas power, Threave, the great castle of that house, being herein. For nearly 200 years after the overthrow of the Douglasses in 1455 it was a border district, the scene of constant warfare in which the Maxwells, Armstrongs, and Johnstones were prominent. It was a Covenanters' stronghold. Under the Douglasses a steward was appointed, and it became known as the stewartry of Kirkcudbright and E. Galloway. It is still called the stewartry. Pop. est. 30,000.

Kirkdale. Parish and village of Yorkshire (N.R.), England. Situated 7 m. N. of Slingsby railway station, Kirkdale is notable for its Saxon church of S. Gregory, partly rebuilt 1880-81, which has



Kirkcudbright. St. Mary's Street, with the town hall in the foreground



Kirkdale, Yorkshire. Porch of the old Saxon church of S. Gregory

a rare sundial. Here is a cave where daylight never penetrates. Discovered in 1821, it is 250 ft. long, and has yielded large quantities of fossils, including remains of the cave-lion, cave-bear, wolf, elephant, rhinoceros, etc., also implements of the Stone Age.

Kirkdale is also the name of a N. suburb of Liverpool, as well as of one of its constituencies; and of an ancient parish of Kirkcudbrightshire, Scotland.

Kirke, Percy (c. 1645-91). An English soldier. He entered the army in 1666 and saw active service in the war against Louis XIV of France, after which, having returned home, he became colonel of a regiment of foot. This, and also one he commanded later, was one of the Tangier regiments, and in 1682 Kirke became governor of that place. He served against Monmouth at Sedgemoor, and fought for William III at the relief of Londonderry. He died in Brussels, Oct., 1691. The second regiment commanded by Kirke, now the Queen's Royal West Surrey Regiment, was known as Kirke's Lambs, first because of the lamb on the regimental badge; afterwards as a sarcastic reference to their brutality.

Kirkenes. A village in the extreme N. of Norway, in the co. of Finmark. Lying on the S. shore of Varanger Fjord, on the border between Norway and Finland, it was the main German submarine base in the Second Great War for attacks on Allied convoys to and from Murmansk. Russian troops under General Meretskoy captured it, Oct. 25, 1944, finding it much damaged by the retreating Germans.

Kirkham. Urban dist. and market town of Lancashire, England. It is 8 m. by railway W.N.W. of Preston. It has a grammar school founded in 1658. There are cotton and flax manufactures, and cattle fairs are held. During the Second Great War the R.A.F. established a training school here for armourers and transport drivers. Pop. 4,031.

Kirkham. Village of the E. Riding of Yorkshire, England. It stands on the Derwent, 16 m. N.E. of York, and has a railway station. Here are ruins of an Augustinian abbey, founded in 1121; they were given to the nation in 1927. Kirkham Abbey is a modern residence.

Kirkintilloch. Burgh of Dumbartonshire, Scotland. It is on the Kelvin, 8 m. N.E. of Glasgow, served by rly. and by the Forth and Clyde canal. The chief build-

ings are the parish church, a restored 17th century building, and the town hall. The public park, called the Peel, contains remains of the Roman wall of Antoninus and of the castle once inhabited by the Comyns. The principal industry is ironfounding, while there are coalmines near by. Kirkintilloch has had local prohibition since 1920. Pop. 14,698.

Kirk Kilisse OR SARANDEKLISIE. Town of European Turkey. It lies about 30 m. almost due E. of Adrianople (Edirne), and is connected by a branch line to the Sofia-Istanbul rly. It came under Greek rule in 1919, but was returned to Turkey in 1922. A battle there on Oct. 23-24, 1912, during the first Balkan war, between powerful Turkish and Bulgarian forces, resulted in a decisive Turkish defeat.

Kirkland Lake.

Town in Kemiskaming co., Ontario, Canada, on the Nipigon Central rly. It has eight hotels, seven churches, schools, a hospital, and four banks. A mining centre, it has in the vicinity gold mines, of which the chief are Lake Shore, Teck Hughes, Wright-Hargreaves, Sylvanite, Macassa, Toburn, and Kirkland Lake. Pop. 18,000.

Kirklees. A village of the W. Riding of Yorkshire, England. It is 4 m. N.E. of Huddersfield, and has remains of a Cistercian nunnery, in which Robin Hood is said to have died.

Kirkliston. Parish and village of West Lothian, Scotland. It stands on the Almond, 8 m. by rly. W. of Edinburgh. The church was once in possession of the Knights Templars. Shale mining and a malt extract factory provide employment. Pop., parish, 4,076.

Kirkmaiden. Parish of Wigtownshire, Scotland. The most S. point of Scotland, it explains why the greatest length of the country is measured "frae Maidenkirk to John o' Groat's." Pop. 1,554.

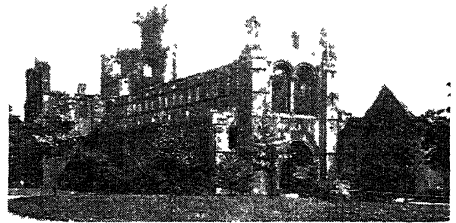
Kirk o' Field. Name given to a church that stood just outside the walls of Edinburgh. It was dedicated to the Virgin, and was allowed to fall into decay, as a result of the notoriety attaching to it through its connexion with Darnley's murder, Feb. 10, 1567. Near was a building formerly belonging to the Dominicans, but then in the possession of some Scottish nobles, the whole being referred to as Kirk o' Field. The

site is covered by the university buildings. See Edinburgh.

Kirkoswald. Parish and village of Cumberland, England. Standing on the right bank of the Eden, it is 15 m. S.E. of Carlisle. The church of S. Oswald was restored in the 19th century; it has a detached tower and some interesting monuments. Here are remains of a castle built in the 12th century.

Another Kirkoswald is a village in Ayrshire, 4 m. S.W. of Maybole, known for its associations with the early life of Burns. Pop. 1,802.

Kirkstall. District of Yorkshire (W.R.), England. Within the city of Leeds, it has its own railway station, is served by Leeds trams and buses, and is famous for its

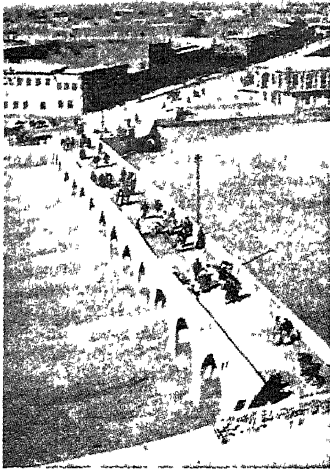


Kirkstall. The remains of the 12th century Cistercian abbey within the City of Leeds

ruined abbey, the best preserved ruin in Yorkshire, excepting Fountains Abbey. A Cistercian house, this was transferred from Barnoldswick to Kirkstall in 1152, and was destroyed at the dissolution of the monasteries. The immediate surroundings are industrial and unattractive, but remains, though clumsily restored in part, are very considerable, including much of the church, the chapter house, and the abbot's lodgings. They were presented to the City of Leeds in 1889 by Colonel North, a "nitrate king," who was made the first freeman of Leeds in gratitude.

Kirkstone. Pass in Westmorland, England. It is 4 m. N.N.E. of Ambleside, on the direct route to Ullswater. Its summit is 1,480 ft. high. The inn there, the Traveller's Rest, is one of the highest inhabited houses in England. The name Kirkstone is taken from a rock at the top, which is somewhat like a church in form.

Kirkuk. Town in the N.E. of Iraq, capital of the liwa of the same name, and probably of ancient Gutium. It lies about 90 m. S.E. of Mosul, and is connected by rly. to Bagdad. An oilfield is operated by the Iraq Petroleum co., and an oil pipe-line leads to Haifa and to Tripoli. A mosque is said to contain the tomb of Daniel. There is a court of appeal. The



Kirkuk, Iraq. View showing the bridge over the dry river bed, which after heavy rains quickly becomes a roaring torrent

capture of Kirkuk in Oct., 1918, was a British success over the Turks. In April, 1941, British forces were sent to Kirkuk to guard its oilfields from a possible coup by the Axis; and on May 3, during the Iraqi revolt, the pipeline to Haifa was cut. Pop. of liwa, 262,209.

Kirkwall. A royal and mun. burgh and seaport of the Orkney Islands, Scotland, also the county town. It stands on the island of Mainland (Pomona), at the head of a bay of the same name, 250 m. N. of Edinburgh. The chief building is the cathedral of S. Magnus, the older parts of which date from 1137; other parts are of the 16th century, and it was restored in 1912-20. It is a large and noble building of red sandstone in the Norman style. The town had a castle until 1614. There are remains of the episcopal palace and of another that belonged to the earls of Orkney; the former has what is called the Mass Tower, the other figuring in Scott's *Pirate*. Kirkwall has been a burgh since the year 1436. Pop. 3,517.



Kirkwall arms

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Kirkwall. Cathedral of S. Magnus and remains of the old episcopal palace

Kirkwood, DANIEL (1814-95). American astronomer. Born in Maryland, Sept. 27, 1814, he became a teacher, and in 1851 was appointed professor of mathematics at Delaware College, becoming its president in 1854. In 1856 he was appointed to the chair of mathematics at Indiana university, and in 1891 became the lecturer on astronomy at Stanford university, California. Kirkwood made remarkable researches in astronomy, particularly in regard to the nebular hypothesis of Laplace. He died June 11, 1895.

Kirkwood, DAVID (b. 1872). Scottish politician. Educated and trained as an engineer on Clyde-side, he became a manager and a strong trade unionist leader of engineers in Scotland. As leader of the Clyde workers who organized protests against an increase in house rents, he was deported in 1916. Kirkwood was Labour M.P. for Dumbarton Burghs, 1922-50, then for Dunbarton E. He helped to secure govt. financial support for building the Queen Mary and Q. Elizabeth. He was made a privy councillor, in 1948. Kirkwood published *My Life of Revolt*, 1935.

Kirov. Town of the R.S.F.S.R. Formerly known as Vyatka, it is the administrative centre of the region of the same name, and stands on the Vyatka river and a branch of the Trans-Siberian rly. Its manufactures include textiles, agricultural implements, and metal goods. Pop. 143,181.

Kirov, SERGEI (d. 1934). Russian politician. Joining the Bolsheviks at 18, he became one of

their leading figures and a close associate of J. V. Stalin. He was appointed to the political bureau of the party in 1930 and was Stalin's chief lieutenant in Leningrad and N.W. Russia, until assassinated in Leningrad, Dec. 1, 1934. He was said to have been Stalin's destined successor; and his murder caused a widespread purge throughout the ranks of the Bolsheviks. By Dec. 30 117 persons, including Kirov's actual murderer Leonid Nikolaev, had been executed; the trial of Kamenov, Zinoviev, and 14 others (all executed) in Aug., 1936, of Radek and Sokolnikov (10 years' imprisonment) and 15 others (13 executed) in Jan., 1937, followed. All were accused of plotting to remove Stalin.

Kirovograd. Town of Ukraine S.S.R. It is the chief town of Kirovograd region, and stands on the rly. between Kremenchug and Pervomaik, about 155 m. S.E. of Kiev. A large part of this important industrial centre was captured intact from the Germans by the Russians on Jan. 8, 1944. Pop. 100,331.

Kirovsk. A town of the R.S.F.S.R. Formerly known as Khibinogorsk, it is situated within the Arctic Circle, in the Murmansk region or Kola peninsula. There are deposits of apatite (mineral phosphate) in the neighbourhood, and the town owes its development to the Soviet five-year plans. A rly. connects it with Kandalaksha.

Kirriemuir. Market town of Angus, Scotland. It stands on Garrie Burn, 6 m. by rly. N.W. of Forfar. It votes in S. Angus. It was the birthplace of Sir J. M. Barrie, who made it famous as Thrums, and of Dr. Alexander Whyte. Barrie's birthplace was purchased for the nation in 1923. It has a fine public park and is engaged in weaving linen. Market day, Friday. Pop. 4,000. See Auld Lights; Barrie, Sir J. M.

Kirschwasser (Ger., cherry-water). Liqueur made from cherries. A product of the Rhineland, it is made by pulping cherries with their kernels. After fermentation of the pulp, the liquor is obtained by distillation.

Kir Shehr. A town of Asiatic Turkey. It is situated on the Kizil Irmak, about 80 m. S.E. of Ankara, and is famous for its carpets. A vilayet is named from it; pop. 157,703.



David Kirkwood, Scottish politician



Kirriemuir arms

Kirtle (A.S. *kyrtel*, tunic). Old name for an article of dress. A development of the primitive tunic, it was a loose gown or petticoat. In Elizabethan times a full kirtle was a petticoat and a jacket; a half kirtle was one or the other.



Kirtle. The full kirtle as formerly worn by women, the skirt (A) being left open to disclose the petticoat beneath

Kirton. The name of two places in Lincolnshire, England. Kirton-in-Lindsey is 6 m. S.W. of Brigg, on the Gainsborough-Grimsby rly. line. S. Andrew's church has some Norman and Early English work. Pop. 1,600. Kirton-in-Holland is 4 m. S.W. of Boston, and has a railway station. There is a grammar school here. Pop. 2,719.

Kirwan, RICHARD (1733-1812). Irish scientist. Born in co. Galway and educated in France, he was called to the Irish bar, 1766, but abandoned law for science, studying in London, 1768-73. Elected F.R.S. in 1780, he was awarded the Copley medal, 1782, for his papers on chemical affinity. In 1787 he returned to Ireland and became president of the Royal Irish Academy, 1799, to which he contributed many scientific papers. In 1787 he published his *Essay on Phlogiston and the Constitution of Acids*, identifying phlogiston with hydrogen. The essay caused great controversy, but ultimately Kirwan was converted by Lavoisier. In 1784 was published his *Elements of Mineralogy*, a valuable contribution to the science. He died in Dublin, June 1, 1812.



Richard Kirwan,
Irish scientist

Kiryu. A town of Japan, in Honshu. Situated 33 m. N.W. of Oyama by rly. and 60 m. N.W. of Tokyo, it is a centre of the weaving industry, producing cotton, silk, and mixed goods. The silk industry dates back to the 8th century, the products rivalling those of Kyoto. Pop. 53,000.

Kisch, FREDERICK HERMANN (1888-1943). A British soldier. Born at Darjeeling, India, he at-

tended the R.M.A., Woolwich, and was commissioned in the Royal Engineers in 1909. He served in the First Great War, and in 1919 was a delegate at Versailles. Retiring from the army in 1922, he went to Jerusalem as a member of the Zionist executive. In the Second Great War, promoted brigadier, he became chief engineer to the 8th army, building the defences at Alamein, but was killed at Susa, April 11, 1943.

Kisfaludy, CHARLES (1788-1830). Hungarian poet, born near Raab (Győr), Feb. 6, 1788. Having served in the Austrian army, he resigned in 1811 and was disowned by his father. After wandering about and studying in Vienna and Italy, he returned to Hungary in 1817, and won recognition of his literary gifts by the drama *Ilka*, 1819. Lyric and epic poems, plays, and novels followed with rapidity, and he became recognized as the centre of the new Magyar literary movement. In stories and ballads he presented all aspects of the national life, and his poem on the battle of Mohács is regarded as a classic. He was a romantic with a marked gift of humour. He died Nov. 21, 1830.

A brother, Alexander Kisfaludy (1772-1844), founded with Charles in 1822 the periodical *Aurora*. He was born at Zala, Sept. 27, 1772, and died Oct. 28, 1844. He published collections of lyrics, Himfy Szerelmei, from 1801, followed by excellent ballads and novels; also dramas. See Hungary: Literature.

Kish. An Akkadian city at El-Oheimir, 9 m. E.N.E. of Hilla, Iraq. The oldest known Babylonian record, from Nippur, mentions Utug, patesi of Kish, several centuries before Sargon of Akkad. A second dynasty, founded by a woman, ruled for a century until overthrown by Sargon. During 1922-28 a temple and brick tombs were discovered.

Kishangarh. A former state of India, now part of Rajasthan. Stone and marble are quarried. Millet, maize, and barley are the chief crops. Exports include cotton and ghi; imports, piece goods and sugar. The ruling house belonged to the Rathor clan of Rajputs. The ruler was a maharaja, entitled to a salute of 15 guns. On June 29, 1947, the maharaja joined in the establishment of the union of Rajasthan (*q.v.*). Kishangarh town, capital of the state, founded 1611 by Kishan Singh, the first chief, is an industrial centre on the rly. N.E. of Ajmer. Area, 837 sq. m. Pop., state, 104,127; city, 13,000.

Kishinev. The capital of Moldavia S.S.R. On a tributary of the Dniester, and the Odessa-Jassy rly., 85 m. N.W. of Odessa, it is the centre of a fertile district. It is connected by rly. with the Danubian ports of Braila and Galatz. Kishinev was occupied by the Russians on June 28, 1940, having been ceded by Rumania, of which it was then the second largest city (pop. 112,500). The Germans took it July 17, 1941, after it had been destroyed by the Russians in their "scorched earth" policy. The Russians recaptured the site Aug. 24, 1944.

Kishm OR QISHM. Island of Persia. Lying on the W. side of the Strait of Ormuz, at the entrance to the Persian Gulf, its E. extremity is almost opposite Bandar Abbas. It is 55 m. long, has an area of about 500 sq. m., and produces sulphur and salt. Its chief town is Kishm or Tavilah. Formerly it belonged to Muscat.

Kishon. River of Central Palestine. It flows through the plain of Esdraelon and enters the Mediterranean about 6 m. S. of Acre. The defeat of Sisera (Judges 4) and the slaying of the prophets of Baal by Elijah (1 Kings 18) took place on its banks.

Kiska. Island of the Aleutian group (*q.v.*) in the N. Pacific, the second largest and nearest but one to Asia. Japanese forces made an unopposed landing on June 21, 1942. U.S. aircraft carried out frequent attacks on military installations, and U.S. and Canadian troops landed on Kiska on Aug. 15, 1943, meeting with no opposition as the Japanese had evacuated the island under cover of fog. This brought the Aleutians once more under Allied control.

Kismayu. A seaport in (Italian) Somaliland. It is 10 m. S. of the Juba river, and is the capital of Jubaland. It possesses the only protected roadstead between Mogadishu and Lamu. During the E. Africa campaign in 1941 British and Abyssinian patriots advanced rapidly into Italian Somaliland, Kismayu being occupied on Feb. 14.

Kismet (Arab. *qismeh*). Mahomedan term for fate or destiny. Its use by a Muslim implies his entire submission to the will of Allah. The word is akin to the Christian phrase, God's will be done. A play of this name, by Edward Knoblock, was produced at the Garrick Theatre, London, April 19, 1911, and had a successful run, Oscar Asche (*q.v.*) taking the principal part. See Mahomedanism.

Kissing. Application of the lips to a person or thing in token of affection, amity, submission, or reverence. In its maternal and amatory forms, *i.e.* accompanied by a minute labial explosion or sharp intake of air, the act stimulates pleasurable emotion through the sense of touch, especially of the lips or face of another: above all, if the kiss is returned. Given to the forehead, hand, or foot, and to clothing, books, or sacred objects, the kiss becomes symbolic or ceremonial.

That this custom is not instinctive or primeval is shown by its rarity in the lower levels of culture. It is virtually unknown among the red and black races, whose lip-ornaments would be an obstacle to its adoption, and also among the yellow races, except—as with Japanese mothers—under European influence. In the Pacific and Arctic regions it is replaced by so-called nose-rubbing.

While the kiss of affection appeared in early Greece, that of respect was characteristic of W. Asia, as shown by many Biblical references. The ceremonial salutation, especially developed by the Persian kings, reached Greece after the Macedonian conquest, and Rome towards the end of the republic, being afterwards adapted to imperial and papal habit. The kiss became a morning salutation of the Roman household, but was interdicted by Tiberius. In medieval England the populace kissed before a carouse, and Erasmus commented upon the freedom of the custom among English girls. The Elizabethan usage of kissing by dancing partners survives in rural parts of Great Britain. The mutual kiss of men, still observed in continental Europe, disappeared in the 17th century from Great Britain.

Early Christian usage adopted the Jewish and pagan practices, but the personal element was discouraged in the public assembly, and has been gradually displaced by symbolic forms. The kiss of peace at the Eucharist, abolished in the 13th century, is now applied to the pax, a metal plaque passed from hand to hand. The Oriental hand-kiss, which spread to the Greco-Roman world, was revived at the courts of Christendom during the Renaissance. Foot-kissing, also of Persian origin, is now reserved for the cross-embroidered slipper worn at papal audiences. The Greco-Roman custom of kissing the feet of temple statues was adopted by the primitive Church, and is still practised upon the toe of S. Peter's

image at Rome. From the same source sprang the Christian practice of kissing the book after oath-taking in courts of law. The so-called cross symbolical of a kiss was originally two acute angles meeting at their apex; representing two pairs of lips in the act of kissing. The cross used as a signature by illiterates symbolises the sacred kiss given to the document by the person swearing to observe its provisions. Consult *The Kiss and its History*, C. Nyrop, 1901; *The Origin of the Kiss*, C. Beadnell, 1942.

Kissingen. One of the most important German spas, in the Franconian hills of Bavaria. Its mineral springs have been used as a remedy for digestive, heart, and nervous complaints since 1544. Bavarian rulers and Bismarck as regular guests made it famous. It has a kurhaus with park, bath houses, a casino, and many hotels, sanatoria, and hospitals. The surroundings, with several other spas such as Brückenau and Bocklet, are attractive, with fine walks in the hills or along the river Saale. Historical associations include a Prussian victory over the Bavarian army, July 10, 1866, and an attempt on Bismarck's life in 1874. The town dates back to 801; in the Middle Ages it belonged to the bishops of Würzburg; from 1803 to Bavaria. The spa had, in peace time, an annual average of 30,000 visitors. Pop. 10,120.

Kistna OR **KRISHNA.** River of S. India. About 800 m. long, it rises in the Western Ghats near Mahabaleshwar, and flows through Bombay for about 300 m. Having passed through Hyderabad, it enters the Bay of Bengal. Near Bezwada its course lies in a gorge of the E. Ghats. The delta is steadily growing seawards. The deltaic area is irrigated by a system of canals based upon a dam at Bezwada. The Tungabhadra, a right bank tributary, drains the N. slopes of the plateau of Mysore.

Kistna. Dist. in India, on the N.E. coast of Madras. It lies between the Kistna and Godavari deltas, and between the Eastern Ghats and the shore. It is mainly under cultivation of rice, cotton, and tobacco. Kolair Lake, between the rivers, was once part of the Bay of Bengal, and indicates the extent to which the river alluvium has pushed away the sea. In the monsoon the lake covers 100 sq. m., and in some rainless seasons it dries up. Area, 3,469 sq. m. Pop. 1,444,294, nearly all Hindus.

Kistrzin. Polish name for former German town of Küstrin (*q.v.*).

Kisumu OR **PORT FLORENCE.** Port of Kenya Colony. Served by the Uganda rly., it is situated at the E. end of the Kavirondo Gulf of the Victoria Nyanza, 584 m. N.W. of Mombasa. Capital of Nyanza prov., it is the headquarters of the steamship service and the principal port on the lake. Here cotton from Uganda is ginned and baled for export. The town has an Indian bazaar.

Kitasato, SHIBASABURO, BARON (1859–1931). A Japanese bacteriologist. Born at Kumamoto. After studying in Germany he established in 1892 an institute for infectious diseases at Tokyo, of which he was director 1899–1914. With E. A. Behring (*q.v.*) he made valuable experiments with the tetanus and diphtheria bacilli and first advocated treatment by serum, and he was one of the discoverers of the plague bacillus. Kitasato was elected a foreign member of the Royal Society in 1908, and was created a baron of Japan in 1924. He died June 13, 1931.

Kit-Cat Club. London society which existed in 1703–20. It was named after one Christopher Cat, keeper of a tavern and pie-house in Shire Lane, near Temple Bar, where its members, leading London Whigs, first met. To provide better accommodation, Jacob Tonson, a London publisher and the founder, added a room to his house at Barn Elms, where the club met latterly, and adorned the walls with the members' portraits painted by Kneller. The room not being lofty enough to permit of the exhibition of the orthodox full-length, Kneller painted the portraits less than half-length, but showing the hands, and this size—3 ft. deep by 2 ft. 4 ins. wide—became known as Kitcat. In 1945 the pictures were presented to the nation, and the Hertfordshire mansion which had housed them for so long was sold to the John Innes horticultural institution.

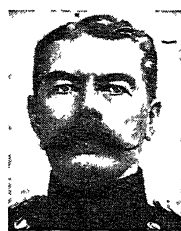
Kitchen (Lat. *coquina*). Apartment where food is prepared. It should be bright and well lighted, with a northerly aspect. The windows should be large, the walls tiled or covered with varnished paper, the floor tiled or with marble chips set in cement, the latter being impervious to moisture. It is best to cover a wood flooring with linoleum. A ventilating shaft is a good adjunct to a kitchen, and there should be ventilators above the cooking stoves to carry off heat, steam, and smell. See *House and Housing*.

Kitchener. City and port of entry of Ontario, Canada. It is 60 m. W.S.W. of Toronto, on the Grand river, and is served by rly. Electric rlys. connect it with Waterloo and Galt. All public utilities are owned by the municipality. It has many churches, a court house, public library, hospitals, and public parks, and obtains electric power from Niagara. The industries include the making of furniture and foundry products. It is also an agricultural centre. Founded by German immigrants, the town was first named Berlin, but was renamed Kitchener in 1916. Pop. 36,165.

Kitchener, HORATIO HERBERT KITCHENER, 1ST EARL (1850-1916). A British soldier and administrator. Born at Ballylongford, co. Kerry, Ireland, June 24, 1850, he passed out of Woolwich in 1870, and volunteered for service with the French army in the Franco-Prussian war, though he did not come under fire. As lieutenant in the R.E., he was on the staff of the Palestine Exploration Fund surveying Palestine and Cyprus, 1874-78. After being present at the bombardment of Alexandria by the British fleet, 1882, he entered the Egyptian army, and saw continuous service in the Sudan expedition for the rescue of Gordon, 1884-85, the Suakim operations of 1888, and the Toski campaign of 1889. Appointed sirdar (commander) of the Egyptian army in 1892, he completed its reorganization and carried through the Dongola operations of 1896 and the Khartum campaign of 1898. The issues raised by the Fashoda (*q.v.*) incident were handled by him with great tact, and on his return to England Kitchener was made a baron, and received a grant of £30,000.

Following the initial disasters of the S. African war, Kitchener was appointed chief of staff to Lord Roberts when the latter took over command there in Dec., 1899. He directed the attack at Paardeberg. Roberts returned to England after the fall of Pretoria, and Kitchener succeeded as c.-in-c. In 1902 he brought the long guerrilla war to a close by the peace of Pretoria (May 31), and received, with the thanks of parliament, a further grant of £50,000, a viscounty, and the O.M. He then served as c.-in-c. in India, 1902-09; then for a few weeks as c.-in-c. in the Mediterranean; and was appointed British agent in Egypt, 1911. In 1914 he was created Earl Kitchener of Khartoum and Aspell.

In England at the outbreak of the First Great War he was appointed secretary of state for war by Asquith, Aug. 5, 1914. At once he took steps to raise a large army, foreseeing that the war would last at least three years. He organized a new British army of 70 divisions (Kitchener's army), but he hesitated to introduce compulsory service, undervalued the potential of the Territorial force, and failed to recognize early enough the importance of high explosive shells. He was also in large part responsible for the failure of operations at Antwerp and in the Dardanelles, partly because of his habit of working without a staff. The responsibility of providing munitions was taken from him by the creation of a separate ministry in May, 1915; and his powers were



1st Earl Kitchener, British soldier

further limited in Dec., 1915, by the appointment of Robertson as C.I.G.S. On June 5, 1916, Kitchener left Scapa Flow on a special mission to Russia, in the cruiser Hampshire. In a storm the same evening the ship struck a mine laid by a U-boat near the Brough of Birsay, and sank with all but 12 men. Kitchener was among those who perished, and his body was never found. One of the wilder legends of the time was that Kitchener was not drowned but was engaged on so secret a mission that his continued existence could not be demonstrated until the war was over. Some years after the war a coffin, said to contain his body, was sent from the Continent, but when opened was found to contain only soil.

Kitchener, who never married, was succeeded in the title by his elder brother. The 3rd earl, Henry Herbert (b. 1919), succeeded in 1937. Consult Kitchener, C. R. Ballard, 1930; Lord K., A. Hodges, 1936; Lord K., H. de Watteville, 1939.

Kitchener Scholarships. Educational grants founded in 1916 by the Lord Kitchener national memorial fund. The value of each is about £150 a year. Originally awarded to the sons of deceased and disabled members of the fighting forces and to young men who had served in the First Great War, to enable them to study commerce in foreign countries, the

scholarships were later granted to men taking courses at British universities.

Kitchen Garden. Cultivated ground, near a house, where fruit and vegetables are grown for household and private consumption only. A S. or S.W. aspect is the most desirable, while a N. or N.E. aspect should be avoided. To ensure a complete supply of fruit and vegetables all the year round, it is necessary to base calculations of area upon the established rule of one rood, or, if the household is large and the land is available, of a third of an acre per head. The ground is often enclosed by a wall or fence, against which fruit trees may be grown. A hedge is undesirable as a boundary, since it takes a considerable amount of nourishment out of the ground, and yields no crop in return.

The shape of a kitchen garden is immaterial, but working is simplified if it is rectangular. The beds should be separated by gravel or cinder paths at least 2 ft. 6 ins. or 3 ft. in width, well drained and kept free from weeds. Generally speaking, a medium loam forms the most useful soil. The fruit and vegetable sections of the garden, although enclosed within the same boundaries, should be kept apart from each other, except in very large gardens. The practice of dotting currant or gooseberry bushes, or even standard apple trees, among vegetables is a bad one, as the fruit trees absorb so much nourishment from the soil that the vegetables are starved. Where space is ample, a series of fruit trees can be grown as horizontal cordons or espaliers (*q.v.*) on wires at the edges of beds.

The plan on page 4862 shows a convenient way of arranging the principal vegetables so that a correct rotation of crops can be carried out. This is assured by growing them on fresh sites each year for three years. Onions, however, may be grown in the same place for a number of years. If the scheme of cropping shown in the plan is adopted, in the second year the maincrop potatoes will take the place of shallot, parsnip, carrot, and beetroot, which will be grown where the peas and early potatoes were in the first year, and so on. Then each crop will be on a fresh site each year for three years. The following, or winter vegetables, as well as the first, or summer ones, will thus be grown in a different part of the plot also.

Rotation of crops plays an important part in the cultivation of

FIRST CROPS			FOLLOWING CROPS		
VEGETABLE	SOW or PLANT	READY for USE	VEGETABLE	SOW or PLANT	READY for USE
Onion	Feb.-March	Autumn and Winter	Spring Cabbage	Sow in July on Spare Border. Plant Sept.	March-June
Shallot	Feb.-March	July-Feb.	Turnip	Sow in July	Oct.-Dec.
Parsnip	March-April	Winter	These crops cannot be lifted in time to allow others to be sown or planted in same year on ground they occupy		
Carrot	April	Winter			
Beetroot	May	Winter			
Leek	Sow on Spare Border in March. Plant in June	Winter and Early Spring			
Early Peas or Broad Beans	March	June-July	Brussels Sprouts	Sow on Spare Border in March. Plant in June	Late Autumn and Winter
Midseason Peas	April	July	Sprouting Broccoli	Sow on Spare Border in April. Plant in July	Late Winter and Early Spring
First Early Potatoes	March	June-July	Winter Cabbage	Sow on Spare Border in April. Plant in July	Dec.-Feb.
Second Early Potatoes	Early April	July-Dec.	Kale	Sow on Spare Border in April. Plant in July	Winter and Early Spring
Dwarf French Beans	April-May	Aug.-Sept.	Turnip (for Turnip Tops)	Sow in Sept.	Late Autumn and Winter
Haricot Beans	April-May	Autumn and Winter	These crops mature too late to allow others to be sown or planted in same year on ground they occupy		
Runner Beans	May	Sept.			
Maincrop Potatoes	April	Winter-Spring			

Kitchen Garden. Table showing a convenient way of arranging the principal vegetables so that a correct rotation of crops can be carried out

vegetables for it allows the whole of the ground to be dug deeply and manured in a period of three years, and thus maintained in a fertile condition. Crops, moreover, extract the utmost benefit from the land; serious attacks by plant pests and diseases are prevented; and labour is saved. For example, if the root crops, *e.g.* parsnip, carrot, and beetroot, are grown on sites which were cropped the previous year with peas, the soil will be in ideal condition for them. It would have been trenched and manured for the peas, thus providing deep and friable soil for the root vegetables; to make the ground suitable for these it is only necessary to fork it over and clear away the weeds. Peas, beans, leeks, and celery can be grown well only on land that has been trenched and manured: the trench should be about 20 ins. deep.

Sowings of seed should be made at intervals of about a fortnight or three weeks, either by reserving a part of the seed, or by obtaining early, medium, and late cropping varieties. In this way there is an ample supply of any desired vegetable over the longest possible season, instead of a wasteful glut at one period, and a scarcity, or complete deficiency, at another.

In addition to the vegetables shown in the plan are several

others not usually included in the rotation but grown on separate small plots, or as catch crops between other vegetables. Of these, summer spinach should be sown in Feb. or early March to yield edible leaves as soon as possible, for the season of greatest scarcity in the kitchen garden is in May. Perpetual spinach is valuable; one sowing in April and another in July will maintain supplies throughout most of the year. Lettuce should be sown in small quantities every two or three weeks from March onwards to keep up an uninterrupted supply. In Aug. seeds for winter lettuce are sown. Kept apart from those shown in the plan are asparagus, Jerusalem artichoke, horseradish, and herbs. A small border should be reserved for herbs that are in frequent demand: *e.g.* thyme, sage, mint, and parsley.

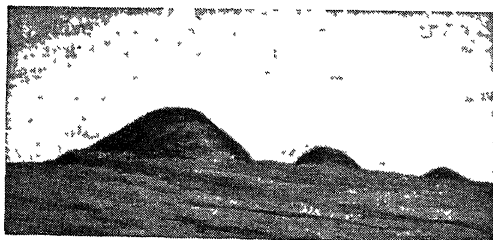
Kitchen garden ground will continue to produce good yields only if it is supplied with humus or decayed vegetable matter. To provide this, a compost heap must be maintained (*see* Compost). It will furnish a cheap and

excellent substitute for stable manure for placing in the trenches dug for peas, beans, and other vegetables which need rich, deep soil. Applications of fertiliser to the vegetables every three or four weeks from the middle of May will prove helpful. The soil will not continue to provide crops if it lacks heavy lime: hydrated lime, at the rate of $\frac{1}{2}$ lb. per sq. yd. every three years, will keep the soil in good condition.

The following quantities of seed are required for a row 50 ft. long: broad bean and runner bean, 1 pint; dwarf French bean, $\frac{3}{4}$ pint; carrot, leek, onion, parsnip, lettuce, turnip, $\frac{1}{2}$ oz.; peas, 1 pint; spinach and beetroot, 1 oz. One packet of seeds each of Brussels sprouts, kale, cauliflower, sprouting broccoli, spring, autumn, and winter cabbage will provide sufficient for the average garden.

Kitchen-midden. Anglicised form of the Danish name for a prehistoric refuse-heap. These heaps usually comprise shells of edible molluscs, with animal bones and occasional relics of human handiwork. There are numerous examples on the Danish coasts, sometimes 1,000 ft. long and 10 ft. high, chiefly of oyster and mussel shells. They were left by semi-nomad hunters and fishers who built rude huts with stone hearths, and fashioned bone and chipped flint implements, horn combs, and shell ornaments. The absence of weaving and of domesticated plants and animals—except the dog—and the occasional presence of rude potsherds, enable them to be allocated to the early Neolithic Age which followed the Azilian. Similar mounds of various periods occur in Sweden and Portugal. There are notable examples at Hastings and Ventnor, and in Cornwall and Carmarthenshire; in Scotland at Oban, Oronsay, Loch Spynie, and in Caithness; in Antrim, N. Ireland; and in Eire, at Cork and Lough Swilly.

In Japan the Omori shell-mounds show fuller knowledge of pottery, akin to the Ainu culture. Similar



Kitchen-midden. Mounds of prehistoric rubbish found in Denmark, which have yielded valuable discoveries

mounds are widespread at Kamchatka and the Aleutian Islands. On the American coasts they occur in British Columbia, California, Maine, and Florida, besides the sambrequis of the Brazilian forests and the shell-heap of Peru and Tierra del Fuego. Corresponding structures in S. Africa, the Andamans, New Zealand, and the mirnyongs of S. Australia and Tasmania, all suggest ultimate relationship with the European Stone Age.

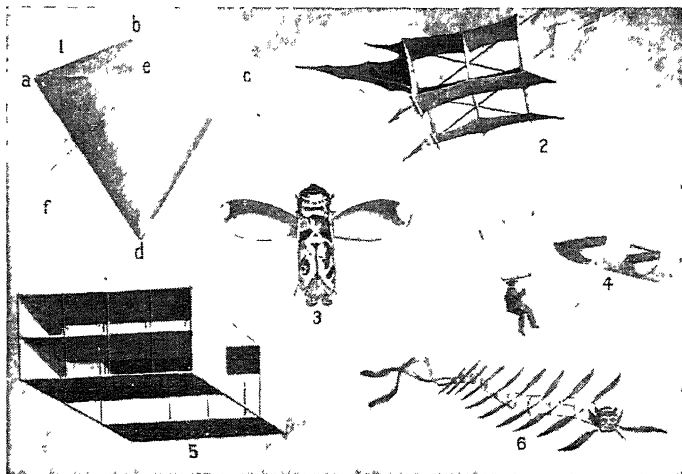
Kite. Popular name for a number of birds of prey of the falcon tribe, but usually restricted to the



Kite. Bird of prey rare in the U.K.

common kite (*Milvus milvus*). This bird is found in most parts of Europe and N. Africa, but is now rare in Great Britain, where it was formerly extremely common. It is about 25 ins. long, and its plumage is reddish-brown on the upper parts and rufous with blackish stripes on the lower parts. The head and neck are whitish, streaked with brown, and the tail is forked and reddish-coloured. Its flight is remarkably rapid and graceful, and it lives mainly on small birds, insects, and offal. The black kite (*M. migrans*) and the American swallow-tailed kite (*Elanoides forficatus*) occur rarely as migrants to Great Britain.

Kite. Device which ascends into the air by virtue of the pressure of a relative wind upon an inclined surface. An aeroplane is merely a power-driven kite. In its commonest form a kite consists of a framework of wood or other light material covered with fabric or paper, forming a flat surface in the shape of an elongated diamond or a triangle with semicircular top, and held stationary in a wind by a string, in such a position that the air strikes upon its lower surface, producing an upward pressure equal to the weight of the kite and the string. Alternatively, the string may be attached to a moving object and the kite caused to rise, in the absence of any wind, by virtue of its own motion through the air. The essential matter is that there should be a relative motion be-



Kite. 1. Standard Malay kite. 2. Cody's man-lifting kite. 3. Japanese pocket kite. 4. Semicircular cellular kite. 5. Box kite. 6. Chinese dragon kite

tween the air and the kite. Some form of tail is needed to steady the kite when being flown.

Although tradition ascribes the invention to Archytas of Tarentum in the 4th century B.C., kites appear to have been devised by the Chinese 4,000 years ago for religious purposes. Kite flying still has a religious significance among the Maoris. Kites are flown throughout China, Malaya, and the East Indies on festive occasions; in China, on every ninth day of the month, men and boys fly kites in the form of animals, birds, fishes, and dragons. Until the invention of the balloon, the kite provided man with his sole means of studying the air above him. Franklin's famous experiment in 1752 demonstrated by means of a kite the identity of electricity and lightning. About the same time attempts were made to measure temperature aloft by flying paper kites carrying thermometers. Man-lifting kites, followed later by kite balloons (*v.i.*), greatly aided military observation and opened up a new field of scientific investigation—the systematic exploration of the upper atmosphere.

Kites used to raise the light meteorological instruments were soon superseded by free balloons capable of attaining much greater heights. Whereas the early investigators had to await the winding in of the kite or the recovery of the balloon attachment before the record obtained could be made available, in present-day ascents into the stratosphere the instruments, mounted on the balloons, signal meteorological conditions immediately by radio to observers on the ground. (See Radio-sonde.)

Kites have this advantage over sounding balloons, that they are not much warmed by solar radiation, nor do they leave in their wake heated air which affects the measurements.

The Hargrave, cellular, or box kite, used in scientific work, consists of a light framework of wood covered with fabric to form rectangular cells. By flying several such kites in tandem a height of 23,385 ft. has been reached. 10 kites and 8½ m. of fine steel wire being used. Heights of 10,000 ft. to 15,000 ft. are common. The standard dimensions of the Malay kite (*see illus.*) are: ac equals bd , and be is one-fifth of bd ; ac is slightly curved; f is the string for flying the kite. *See Aeronautics; Box Kite. Flight; Meteorology.*

Kite Balloon. Type of balloon developed for military observation purposes and employed for artillery spotting in the First Great War. The balloon was fitted with gas-filled fins to keep its head into the wind, and tethered to the ground by a steel cable. The observer, housed in a basket suspended beneath the balloon, was in telephonic communication with the ground. Kite balloons were eventually replaced by army cooperation aircraft. Throughout the Second Great War, an improved version called the barrage balloon (*q.v.*) was widely employed in passive A.A. defence. *See Balloon.*

Kit's Coty House. Dolmen in Kent, England. About 1½ m. N.E. of Aylesford, it consists of three upright stones 8 ft. high with a capstone 11 ft. long. It was probably made by a race far earlier than that which set up

crumlechs, but is traditionally supposed to be the tomb of Katigern or Cortigern, slain in battle with Hengist and Horsa. The name may be derived from Welsh *Ked Coitt*, tomb in the wood.

Kittiwake (*Rissa tridactyla*). A bird of the gull family. Common on the British coast, also on the W. side of the Atlantic, it breeds in enormous numbers in Greenland and Spitzbergen and is also found in the N. Pacific. About the same size as the black-headed gull, it resembles the herring gull in its grey and white coloration. It differs from the latter, however, in



Kittiwake. Member of gull family common on the British coast

having the first three primaries grey tipped with black, and the feet black with hind toe rudimentary or missing. It is a good swimmer and diver, and feeds upon fish chiefly. The nest of seaweed and grass is placed on a ledge of a lofty cliff, and there are two or three pale buff or whitish eggs, spotted and blotched with reddish-brown. The young kittiwake is known as a tarrock.

Kitto, JOHN (1804-54). British writer. He was born at Plymouth, Dec. 4, 1804, the son of a stonemason. In the course of a life of almost continuous vicissitude he became stone deaf through a fall, learned shoemaking in a workhouse, printing in the missionary college of the C.M.S. at Islington, and was pupil to a dentist. He was employed in Malta by the C.M.S., took part in a private mission in the East, and in addition to bringing out *The Pictorial Bible*, 1838; *Pictorial History of Palestine*, 1840; and a *Cyclopaedia of Biblical Literature*, 3 vols., 1843-45, was author of *The Lost Senses*, 1845, a study of the life of the blind and the deaf and dumb. He edited *The Journal of Sacred Literature*, 1848-53. He died at Cannstadt, Nov. 25, 1854. *Consult* Life, J. Eadie, 1857.

Kittyhawk. A type of fighter aircraft, designed and produced by the Curtiss-Wright corporation (U.S.A.). Known to the U.S. army as the P-40 or Warhawk, it

was a single-seater machine powered by a liquid-cooled Allison or Packard-Merlin engine, with maximum speed of over 350 m.p.h. Wing span was 37 ft. 3 ins.; length 31 ft. 8 ins., later increased to 33 ft. 3 ins. It was used in the Pacific war theatre, replacing the Tomahawk, also designated P-40. *See* Aeroplane illus. p. 131.

Kitty Hawk. Village of North Carolina, U.S.A., near Elizabeth City. It was the scene of the Wright brothers' earliest flying trials, including the first recorded aeroplane flight on Dec. 17, 1903. The Wrights had chosen Kitty Hawk in 1900 for the glider tests which preceded the building of their first powered aeroplane because of the high wind velocity in the neighbourhood. *See* Aeroplane illus. p. 135.

Kitzbüchel. A town in N.W. Austria, in the Kitzbuhler Alps about 50 m. E.N.E. of Innsbruck. A winter sports centre, it was patronised by the duke of Windsor when prince of Wales. Pop. 3,500.

Kitzingen. Town of Germany, in Bavaria (Lower Franconia). It stands on the Main, 47 m. W.N.W. of Nuremberg. Notable buildings include the Gothic parish church (15th century), the early Renaissance town hall (16th century), and a leaning tower. The town is connected with the suburb of Etwashausen, on the opposite bank, by a bridge dating from 1500. Kitzingen is a manufacturing centre and trades in wine. Pop. 10,950.

Kiu-kiang. A former treaty port of China, in the province of Kiangsi. Situated on the Yangtse, 440 m. from the mouth, it was opened to foreign trade in 1862. Kiu-kiang, connected by rly. with the provincial capital, Nanchang, is the distributing centre for a large tea trade. Beans, tobacco, fibres, paper, chinaware, and rice are other leading exports. It is the port for steamer traffic on Lake Poyang; except during the winter drought the steamers can reach Nanchang. Pop. 60,000.

Kiungchow. A former treaty port, capital of the island of Hainan, China. Opened to foreign trade in 1876, Kiungchow lies 3 m. from the N. coast, and Hoihow, its port, is the real commercial centre, where the foreign consulates and the maritime customs are established. The walls of Kiungchow were built in the 14th century. Pop. 29,000.

Kivu. A lake in the Belgian Congo, between Lakes Edward and Tanganyika. It discharges into the

latter by means of the Russizi river, and is the centre of a great volcanic district. Measurements are N. to S. 55 m., E. to W. 30 m.

Kiwi. Native name for a flightless bird of New Zealand, also known as apteryx (q.v.).

Kizilbash (Turkish, red-head). Name denoting, in allusion to their red caps, an unorthodox Muslim community, mostly in Asiatic Turkey. Calling themselves Alevi, and estimated as numbering 1,000,000, especially congregated near Sivas, Erzerum, and Ankara, they are industrious cultivators and traders, hostile to the Turks. Apparently representing a Persianised Altaian stock, in their beliefs and practices, including secret nocturnal rites, they retain much of the primitive animism of W. Asia. This is overlaid by early Christian usages, and by a lax and unwilling Shia Mahomedanism, due to Seljuk subjugation.

The more combative Kizilbashes of Afghanistan, perhaps a different ethnic strain, are descended from an 18th century immigration, under Nadir Shah, and form the backbone of the ameer's cavalry.

Kizil Irmak. River of Asiatic Turkey, the ancient Halys. It is the longest wholly in the country, but unnavigable owing to difficult gorges and frequent rapids. It rises in the Karabel Dag, about 80 m. E. of Sivas, and after a course of more than 500 m. falls into the Black Sea E. of Sinöpe.

Between Kaiseriyyeh and Sivas the great road across Asia Minor between Samsun and Tarsus is on the left side of the valley below the watershed which separates the Black Sea drainage from that to the Mediterranean Sea or Persian Gulf. The river receives but few tributaries, all short except the Delidje Irmak, which drains an area almost encircled by the main stream. The mouth is deltaic and is the W. limit of a belt of dense pop. along the Black Sea coast. The word means red river.

Kizil-Kum. Desert of Asiatic Russia. It lies in Kazakh S.S.R. and Kara-Kalpak A.S.S.R., between the rivers Syr Darya and Amu-Darya, to the E. of the Sea of Aral. It extends 375 m. from E. to W., and 220 m. from N. to S. An old dried-up basin, it was formerly united with the Sea of Aral, and is full of movable sand-dunes (*barchans*). The name in Turkish means red sand.

Kizil Uzen. A river of N.W. Persia. Rising in the high mountains of the province of Ardelan, it

flowsthrough Khamseh, Azerbaijan and Ghilan provinces, and falls into the Caspian, about 30 m. E. of Resht. It has a course of about 450 m., but is not navigable. The lower course is called Sefid Rud.

Kjölen Mountains. Series of plateaux and peaks on the borders of Norway and Sweden. They trend N.N.E. from Tröndelag to Finmark. The name means keel, the ranges forming the backbone and watershed of the N. of the peninsula. One of the highest peaks is Kebnekaise, in Sweden, alt. 7,080 ft. Another peak, Sulitelma, alt. 6,180 ft., is noted for its copper mines and glaciers.

Kladderadatsch. A satirical weekly founded in Berlin in the year of the 1848 revolution. Though frequently prosecuted, its nationalist outlook and enthusiastic support of Bismarck made it a power in Prussian politics. The poet Johannes Trojan (1837-1915) and the cartoonist Wilhelm Scholz (1824-93) were outstanding contributors. The paper was suppressed by the Nazis.

Kladno. A town of Czechoslovakia. It is in Bohemia, 15 m. W.N.W. of Prague. A manufacturing town, employed in the iron and steel industry, it lies in a coal mining district. Pop. 41,655.

Klagenfurt. Town of Austria, in Carinthia. It lies on the Glau, 24½ m. by rly. E. of Villach. The parish church, rebuilt in the 17th century, has a domed tower 300 ft. high. The cathedral, built as a Protestant church in the 16th century, was taken over by the Jesuits, and became a cathedral in 1787. The Landhaus also dates from the 16th century, as does the Dragon fountain in the Neuer Platz. The Rudolph museum contains various historical collections dealing largely with Carinthian antiquities, as well as a natural history exhibit.

Klagenfurt was the capital of the duchy of Carinthia in 880. For about 150 years after 1122 the duchy belonged to the counts of Lavant; it became part of Austria in 1335. After the First Great War, Yugoslavia claimed the district, but it went by plebiscite to Austria. Klagenfurt was bombed in the Second Great War; troops of the British 8th army entered on May 14, 1945, after the end of fighting in Europe. Pop. 56,701.

Klaipeda. Lithuanian name of the town better known by its German name Memel (*q.v.*).

Klamath. American Indian tribe in S.W. Oregon, U.S.A. They are a branch of the Lutuamian

stock, and with the other branch, the Californian Modoc, were settled in the Klamath reservation in 1864. Formerly hunters and fishers, they made arrowheads by splitting stones with fire and pressure-flaking them with bone implements. They are now employed as cattle raisers.

Klamath. River of the U.S.A. Rising in Upper Klamath Lake, in Oregon, it flows S.W. into California, and bends N.W. to the Pacific. It has a circuitous course of about 270 m., and drains an area of nearly 12,000 sq. m. The river has cut a series of cañons in the mountains through which it passes, and descends over 100 ft. a mile for the greater part of its course. The upper course is used for irrigation, and has potential sources of water power. The river is navigable for about 40 m. from its mouth, but is obstructed by a bar at low tide.

Klang. River, town, and island in Selangor, Malay Peninsula. The river rises in the central mountain ridge, and flows past Kuala Lumpur S., and then S.W. to the town, which is on the estuary. Port Swettenham is lower down the estuary, at the mouth of which lies Klang Island. The river valley is followed by the rly. from Kuala Lumpur to Padang Junction, whence a branch goes through Klang, to Port Swettenham.

Klapka, GEORG (1820-92). Hungarian soldier. Originally a lieutenant in the Austrian army, on the outbreak of the Hungarian national rising he joined his countrymen, and fought in Transylvania and against the Serbs. As a staff officer and then as general he did brilliant work, distinguishing himself especially by his defence of Komorn in 1849. In the war of 1866 he served as a Prussian general, organizing a Hungarian legion. He died at Budapest, May 17, 1892.

Klaproth, HEINRICH JULIUS (1783-1835). German orientalist. The son of Martin Heinrich Klaproth (*v.i.*), he was born in Berlin, Oct. 11, 1783, and was employed by the Russian government 1804-12. An embassy to which he was attached being turned back from China, he travelled in Siberia and the Caucasus, making valuable linguistic, ethnographical, and geographical discoveries. He was disgraced in 1812, but was patronised by Frederick William III of Prussia, who made him an honorary professor of Asiatic languages, 1816. He lived in Paris from 1815 until his death, Aug. 20, 1835. His works include *Travels in the*

Caucasus and Georgia, 1812-14; *Asia Polyglotta*, 1823; *Historical Pictures of Asia*, 1823. His *Itinerary of a Chinese Traveller*, 1821, is said to be a set of bogus documents.

Klaproth, MARTIN HEINRICH (1743-1817). A German chemist. Born at Wernigerode, Dec. 1, 1743, he was for many years an apothecary. When the Berlin university was opened in 1810, Klaproth became its professor of chemistry. He devoted much time to research, and discovered uranium, titanium, and zirconium, although not in pure form. He also executed analytical work on the composition of chromium and various other substances. He died Jan. 1, 1817.

Klatovy OR KLATTAU. Town of Czecho-Slovakia, in Bohemia. It lies 30 m. by rly. S. of Pilsen, and has varied manufactures. Pop. 14,400.

Klausenburg. German name for the Transylvanian town called by Hungarians Kolozsvár and by Rumanians Cluj (*q.v.*).

Klausthal. Town of central Germany. It lies among the Harz Mts., 50 m. W.S.W. of Halberstadt, on a plateau 1,860 ft. above sea level. Built round a Benedictine abbey in the 12th century, it later became part of the duchy of Brunswick. By the 16th century, silver and lead mines were worked in the neighbourhood. In 1864 the mines passed under state control. Klausthal forms almost one town with Zellerfeld, from which it is separated by the Zellbach. It contained churches, schools, and a college of mines with a museum. Pop. 12,370. *Pron.* Clowz-tahl.

Kléber, JEAN BAPTISTE (1753-1800). French soldier. Born at Strasbourg, March 9, 1753, he



served in the Austrian army and joined the French revolutionary army as a volunteer in 1792. Next year he became a brigadier-general and fought against the royalists in La Vendée. After service against the

Austrians, in which he won the victory of Altenkirchen in 1796, he accompanied Napoleon to Egypt, and in the Syrian campaign won the battle of Mt. Tabor, April 15, 1799. On Napoleon's return to France, Kléber became

commander-in-chief, and concluded a convention for the evacuation of Egypt. Ratification of the convention being refused by the British authorities, Kléber took up arms again and defeated the Turks at Heliopolis, March 20, 1800. He was murdered, June 14, in Cairo.

Klebs, EDWIN (1834-1913). A German bacteriologist. Born at Königsberg (Kaliningrad), Feb. 6, 1834, he became professor of pathological anatomy at Berne, 1866; Würzburg, 1871; Prague, 1873; and Zürich, 1882, retiring 1892. With Loeffler he discovered the diphtheria bacillus (*v.t.*). He made valuable investigations into malarial fever and the bacteriology of gunshot wounds. Klebs died Oct. 23, 1913.

Klebs-Loeffler Bacillus. The causative organism of diphtheria, called after the scientists who isolated it. Where any doubt exists in the mind of the physician as to the nature of a sore throat, a swab should be taken. On examination the presence of these bacilli indicates diphtheria.

Klee, PAUL (1879-1940). Swiss painter. Born near Berne, Dec. 18, 1879, Klee studied at Munich academy, 1898-1901, and after visiting Paris and Rome, settled at Munich. Appointed professor at Düsseldorf academy, 1932, he resigned when the Nazis came to power, and returned to Berne. He died near Locarno, June 29, 1940.

Klee's early style was satirical, but he came under the influence of Cézanne and Picasso, experimenting in Cubism until 1914, when he became an abstractionist. Love of poetry and music are reflected in his work. His characteristic pictures were based on surrealist imagery, notable for delicate fantasy, and fine draughtsmanship. In 1912 he founded with Kandinsky and Marc the movement known as Blaue Reiter. Klee made prints, e.g. illustrations for *Candide*, 1912. An exhibition of his works was held at the National Gallery in 1945. *Consult biogs.* by L. Zahn, 1920; R. Crevel, 1930; H. A. Barr, 1942. *See Art illus.* p. 665. *Prom. Clay.*

Kleffens, EERLOO NICOLAAS VAN (b. 1894). Dutch diplomatist. Born at Heerenveen, Nov. 17, 1894, he studied at Leyden university. He was on the League of Nations secretariat, 1919-21. Deputy-chief of the legal section of the Dutch foreign ministry, 1923-27, he was chief from 1929 until appointed minister to Switzerland, 1939. Foreign minister when the Germans invaded his country, Kleffens

accompanied the government to London in 1940. He was reinstated in office under Gerbrandy, and under Schermerhorn in 1945. In 1946 he became Netherlands representative on the security council of the United Nations.

Klein, CHARLES (1867-1915). An American dramatist. Born in London, Jan. 7, 1867, he went to New York in his youth and was employed by Charles Frohman (*q.v.*). Beginning with *A Mile a Minute*, 1890, he wrote successful plays, of which *The Auctioneer*, 1901, and *The Lion and the Mouse*, 1905, were the most popular. He was lost in the sinking of the *Lusitania*, May 7, 1915.

Kleist, HEINRICH VON (1777-1811). German dramatist. Born at Frankfurt-on-Oder, Oct. 18, 1777, he entered the army, but in 1799 forsook it for literature. He wrote many plays, the best of which are *Die Hermannschlacht* (Hermann's Battle), 1809; *Käthchen von Heilbronn* (Katie of Heilbronn) 1810; *Der zerbrochene Krug* (The Broken Jug), 1812; *Der Prinz von Homburg*, 1821. Only two of these plays were performed during the author's lifetime, though since they have gained him recognition as the chief Prussian dramatist of the Romantic period. Of his numerous stories, *Michael Kohlhaas*, 1808, is regarded as the best novelette in the German language. Kleist shot himself at Potsdam, Nov. 21, 1811. *Consult Life, O. Brahm*, 1911.

Kleist, PAUL LUDWIG EWALD VON (b. 1881). A German soldier. Kleist was born at Braunsfels, Prussia, August 8, 1881, and educated at a military school; he served with the cavalry and as a staff officer during the First Great War. A corps commander from 1938, he took part in the campaigns in Poland, in 1939; France, in 1940; and Yugoslavia, in 1941. During the fighting in Ukraine his tank army led the attack on Kiev and captured Rostov. Then he conducted the Caucasus offensive and was promoted field-marshal. After the German retreat Kleist was relieved of his command, and was recalled to succeed Manstein on the S. Russian front in 1944. Again falling into disfavour, he retired to Bavaria, being near Straubing

when he surrendered to U.S. troops on May 4, 1945. In 1946 he was delivered to the Yugoslavs for trial.

Klemantan OR **KALAMANTAN**. A primitive people of Indonesian stock, mostly in S. Borneo. Estimated as numbering 1,000,000, including settled agricultural tribes commonly designated land Dyaks, they are a medium-headed, straight-haired, dark cinnamon people, 5 ft. 2 ins. in height. They represent aboriginal hunting nomads, of whom some have absorbed the Kayan culture, some the Kenyah, some the Murut. *See Borneo; Dyak.*

Kleptomania (Gr. *kleptein*, to steal; *mania*, madness). Symptom seen in certain forms of mental imbalance in which there is a propensity to steal articles. It may occur in the course of epileptic insanity or general paralysis of the insane. Sometimes cumbersome articles are taken, sometimes objects of value. In true kleptomania, an obsessive, compulsive neurosis, the objects stolen are worthless or unneeded.

Klerksdorp. Town in Potchefstroom prov., Transvaal, S. Africa, 29 m. S.W. of Potchefstroom by rly. The old village was the first Boer settlement in the Transvaal (1838). Klerksdorp is the centre of a gold-mining district. The gold reefs are a westward continuation of the Rand; they yielded well during the booms of 1889 and 1895, and in recent years have again promised well. Small sized diamonds are found in the neighbourhood. This is the market for the most important cattle district in the W. of the state. Irrigation works have been erected on the Schoonspruit, on which the town is situated. Pop. 15,950.

Klinger, FRIEDRICH MAXIMILIAN VON (1752-1831). German dramatist. Born at Frankfurt-on-Main, Feb. 17, 1752, he studied at Giessen and, encouraged by Goethe, turned to literature. His tragedy, *Die Zwillinge*, 1775, attracted the attention of the actor Schröder, and for two years Klinger was connected with theatrical work. In 1776 he wrote *Sturm und Drang* (Storm and Stress), a tragedy which gave its name to the literature of his period. In 1778 he entered the Austrian army, which, 1780, he exchanged for the Russian. He married a natural daughter of the empress Catherine. He wrote *Fausts Leben, Taten, und Hellenfahrt*, 1791, and *Geschichte Giefars des Barmeciden*, 1792. Curator of the university of Dorpat (Tartu), 1803-17, he died there, Feb. 25, 1831.



H. von Kleist,
German dramatist

Klinger, Max (1857-1920). A German painter. Born at Leipzig, Feb. 18, 1857, he studied at Karlsruhe and Berlin.



Max Klinger,
German painter

An out-and-out realist and an artist of pronounced originality, he showed equal vigour and resourcefulness in painting, etching, and sculpture. His pictures include *The Glove*, *Eve in the Future*, *The Judgement of Paris*, *Pietà*, *The Crucifixion*, and *Christ in Olympus*; among his more notable etchings are *Death*, *Cupid and Psyche*, *A Life*, and *Fantasies on Brahms*; his finest sculptures are *The Dance*, *Beethoven*, and *Cassandra*. In 1895 he was appointed to a professorship in the Vienna academy, which he resigned. He wrote a treatise defending realism in oil painting. He died July 5 or 6, 1920.

Klinostat. A device used in plant physiology for rotating plants either on a vertical or on a horizontal axis. The apparatus is used in the study of geotropism and heliotropism. If a plant or seedling is laid on its side, the stem tip soon bends upwards and the root tips downwards. These curvatures are in response to the influence of gravity, as is indicated by rotating a plant slowly on a klinostat with a horizontal axis so that gravity pulls on all sides equally in turn. Under these conditions no geotropic curvatures occur. Similar rotation of a plant subjected to one-sided illumination on a vertical axis prevents heliotropic bending of the stems towards the stronger light.

Klip. River in Natal. Rising in the Drakensberg Mts., it falls into the Tugela, a few miles above Ladysmith. Klip River dist. is a large div. in the N.W. of the prov., contiguous with the Orange Free State; Ladysmith is the chief town.

Klipspringer (*Oreotragus saltator*). Small species of antelope which occurs throughout E. Africa, usually in rocky districts. The name means rock-jumper, and well describes its habits. Its feet are so small that, when they are placed together, the animal can stand on a crown piece. In colour it is olive above and lighter below; the horns are short, straight, and vertical. See Antelope.

Klisura. Town of Albania. On the Voyusa (Vijose), it is 18 m. N. of Argyrokastrò. Captured by the

Greeks from the Italians on Jan. 10, 1941, Klisura was evacuated in April after the German invasion of Yugoslavia and Greece. It was liberated when the Germans withdrew from Albania late in 1944.

Kloet, KLUT, OR KALUT. Active volcano of Java. One of the smaller volcanoes of the island, it is situated S.W. of Pasoeroean in the mountainous spine. In May, 1901, it erupted, destroyed the sugar crop, and killed Europeans and natives. On May 19-20, 1919, another eruption on a stupendous scale blew away the side of the crater wall, released the waters of the crater lake, and covered the adjacent slopes with a liquid mud made from the ash and water. The deluge destroyed 30 sq. m. of sugar and rice plantations, 12 villages, and 20 m. of rly. Over 40,000 lives were lost.

Klondike. River and district of the Yukon Territory, Canada. The river is about 120 m. in length, and joins the Yukon near Dawson City. The district lies E. and S. of the river. In 1896 placer gold was discovered in the creeks that flow into the larger streams, and about 30,000 people joined a "gold rush." By 1900 production was valued at \$22 millions, but afterwards the output began to decrease. See Yukon.

Klopstock, FRIEDRICH GOTTLIEB (1724-1803). German poet.



Born at Quedlinburg, July 2, 1724, he studied theology at Jena and Leipzig. The influence of Virgil, the Bible, and *Paradise Lost* was so great that while still at Jena, he had planned his long and famous poem *Der Messias* (The Messiah). At Leipzig he published the first three cantos, 1748; the last 20 did not appear until 1773. During 1751-70 he lived at Copenhagen, in receipt of a pension from the Danish king. Later he settled at Hamburg, where he died, March 14, 1803. The greatest religious poet of his time, he wrote odes, tragedies, dramas, and hymns. In the lyric style his gifts were most happily employed. Consult F. G. Klopstock, F. Muncker, new ed. 1900.

Klosterneburg. A town of Austria. It stands on the Danube, 5 m. N. of Vienna. It is a centre of the wine industry, and has

churches and schools, but its claim to fame is the monastery, said to be the richest in Austria. This was founded in 1108 by Leopold, margrave of Austria. The 13th century cloisters still stand, but the magnificent pile of buildings is mainly 18th century. It includes a library and picture gallery as well as the usual monastic apartments on a grand scale. The treasury contains objects of interest, and the chapel, in which is the tomb of the founder, has the altar of Verdun, a wonderful piece of work dating from 1181. The town grew up around the monastery, becoming corporate 1298. Pop. 14,800.

Kloster-Zeven. A village of Hanover, Germany. It is 24 m. S.W. of Stade and is famous for the agreement, or convention, signed here between the Hanoverians, under the duke of Cumberland, and the French, Sept. 8, 1757. The Seven Years' War had just begun, but efforts were made to prevent its extension, and the king of Denmark succeeded in arranging this convention. By its terms half of the Hanoverian army retired across the Elbe and the other half was interned. The other troops returned to their own states. Hanover was thus left at the mercy of the French. The convention aroused great indignation in England. George II refused to recognize its validity, and Cumberland was obliged to retire from the army. See Seven Years' War.

Kluck, ALEXANDER VON (1846-1934). German soldier. Born at Münster, May 20, 1846, he was commissioned in the Prussian army in 1865 and served in the wars of 1866 and 1870, being wounded at Metz. He was in command of the German 1st army which overran Belgium in Aug., 1914. After receiving the surrender of Brussels and masking Antwerp he drove the British from Mons, capturing Tournai and Maubeuge, but his error in exposing his flank while marching on Paris led to the German defeat on the Marne. Kluck stood on the Aisne, and early in 1915 was fighting for Soissons, which he failed to take. He retired in 1916 as field marshal, and died Oct. 19, 1934. Consult his *March on Paris*, 1920.

Klutchevskaya. Volcanic mt. of Kamchatka, in the Far Eastern region of the R.S.F.S.R. Rising 15,570 ft., it is thought to be the highest peak of the Kamchatka range. The last time it was in eruption was in 1854.

Knacker. The name given to a dealer in old horses, which are

used for dogs' and cats' meat. Derived from an Icelandic word for a saddle, it is the colloquial word for a collier's horse.



Knapweed. Perennial herb of the waysides

Knapweed (*Centaurea nigra*). Perennial herb of the family Compositae, native of W. Europe. Similar to, but smaller than, the hardhead (*q.v.*), it has leaves entire or lobed, and the smaller flowerheads are of a duller purple and

are more thistle-like. Knapweed abounds in pastures and waysides.

Knaresborough. Urban dist. and market town of the W. Riding of Yorkshire, England. It is on the Nidd, 3½ m. N.E. of Harrogate, with a rly. station. Conspicuous on a rocky pinnacle are picturesque ruins of the castle supposed to have been built by Serlo de Burgh soon after the Conquest. Here the murderers of Becket found shelter for one year, and Richard II was imprisoned. The castle, which was a residence of Piers Gaveston, Henry III, and John of Gaunt, was dismantled in 1648, and from its fabric many houses in the town were originally constructed. In the church are noteworthy monuments of the Slingsby family.

In S. Robert's Cave, Eugene Aram (*q.v.*) in 1745 concealed the body of the murdered shoemaker Daniel Clark. Another local feature is the Dropping Well, famous for the petrifying qualities of the water. Knaresborough is the reputed birthplace of Ursula Southiel, called Mother Shipton (*q.v.*), the prophetess, and of John Metcalf

(*q.v.*), the blind road-making pioneer and bridge builder. Surrounded by populous villages, the town is celebrated for its linen trade and agricultural market. Market day, Wed. Pop. 7,700. Consult History of the Castle, Town, and Forest, E. Hargrove, 7th ed. 1832.

Knaus, Ludwig (1829-1910). German portrait and genre painter. Born at Wiesbaden, Oct. 5, 1829, he studied under Schadow at Düsseldorf and then in Paris. He worked at Düsseldorf and Berlin, and in 1865 obtained a professorship at the Berlin Academy. The Royal Academy, London, bestowed honorary membership upon him and he was created chevalier of the legion of honour in 1867. Besides rustic scenes, he executed portraits of Helmholtz and Mommsen. He died Dec. 7, 1910.

Knave. In playing cards, a synonym for jack (*q.v.*).

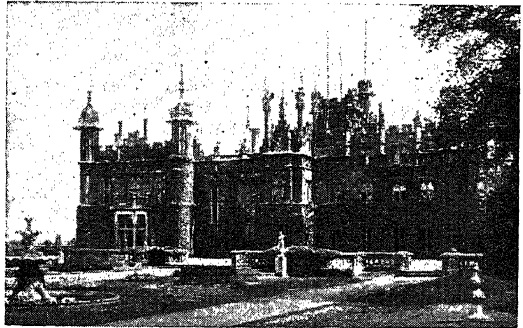
Knebworth. Parish and village of Hertfordshire, England. It is 25 m. N. of King's Cross, London. Knebworth House, the seat of the earl of Lytton, is in the parish. It was erected early in the 19th century on the site of an older house in the Tudor style. The estate has been owned by the Lyttons since 1490. Viscount Knebworth is a courtesy title in this family. Pop. of village, 2,700. See Lytton.

Knee-joint. Hinge-joint, formed by bony prominences or condyles at the head of the femur or thigh-bone, the flattened head of the tibia or main bone of the lower leg, and the patella or knee-cap.

The knee-joint is the largest articulation in the body. It permits only of the movement of extension or straightening the leg, and flexion or bending the knee, there being no lateral mobility. The bones forming the joint are kept in their position by strong liga-

ments. The capsular ligament completely invests the joint. The ligamentum patellae is attached to the front of the upper part of the tibia and to the lower part of the knee-cap. In addition to the ligaments surrounding the joint, there are two crucial ligaments inside the joint, which cross each other in the space between the two condyles of the femur. The articular surface of the tibia consists of two cartilaginous plates, the semilunar cartilages. The muscles which produce extension of the knee-joint are the four divisions of the quadriceps extensor, the large muscle which forms the anterior part of the thigh. Those which produce flexion are the biceps, popliteus, sartorius, gracilis, semitendinosus, and semimembranosus, which form most of the back of the thigh, and also the gastrocnemius muscle of the calf.

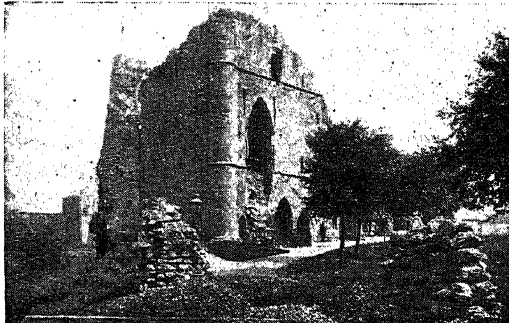
Dislocation of the knee may be lateral, forward, or backward. Reduction is easily accomplished



Knebworth House, Herts, seat of the earl of Lytton, built early in the 19th century on the site of a Tudor house
Frith

when the condition is due to violence. The joint should be kept at rest on a splint for 2-3 weeks.

Displacement or rupture of a semilunar cartilage is a common result of strain or sprain of the knee, particularly when associated with a movement of rotation, and any sudden wrench. The symptoms are sudden severe pain in the knee, and the joint becomes partially locked in a flexed position. The condition may persist for some hours and then the joint suddenly becomes free. Sometimes the individual can, by wriggling his leg, restore its mobility. The limb should be kept at rest until any inflammation which has appeared has subsided, and should subsequently be immobilised for some weeks in plaster of Paris. Appliances to be worn outside the knee, with the object of keeping the cartilage in its place, have been



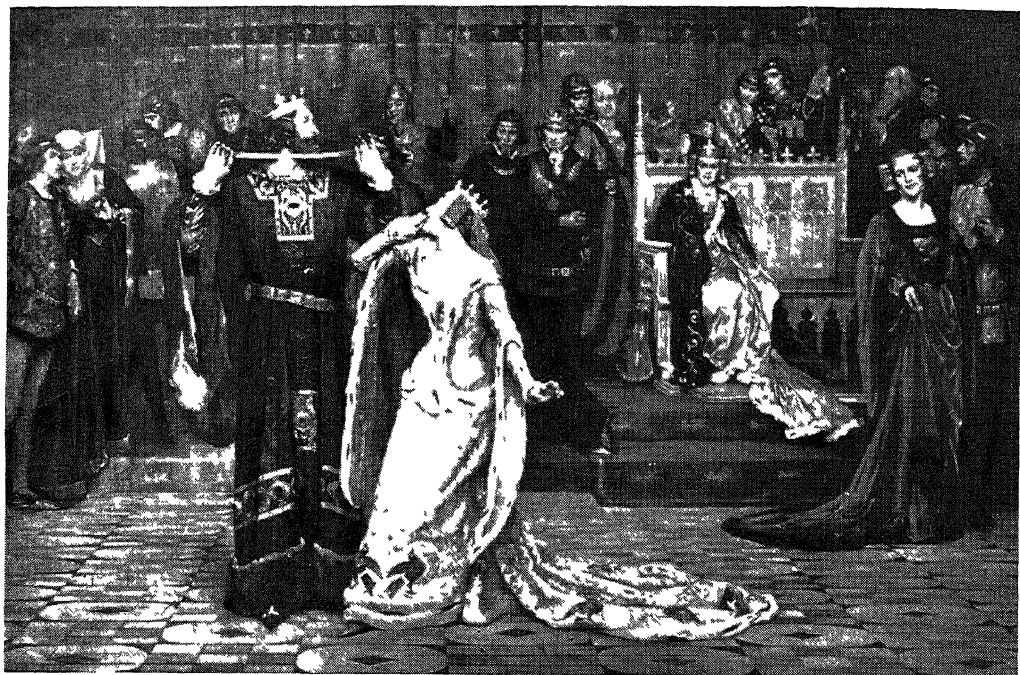
Knaresborough, Yorkshire, Ruins of the old castle, a residence of Henry III, dismantled in 1648
H. T. Hall



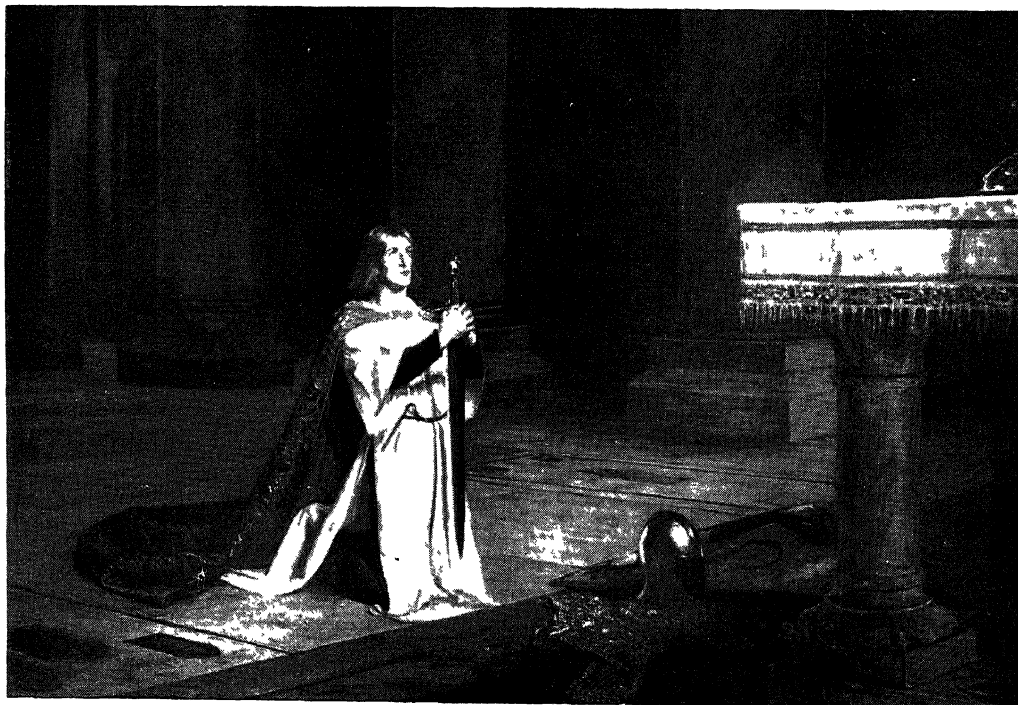
Left to right—top row: Most Noble Order of the Garter; Most Ancient and Most Noble Order of the Fishie; Most Illustrious Order of S. Patrick. Bottom row: Most Exalted Order of the Star of India; Most Honourable Order of the Bath; Most Distinguished Order of S. Michael and S. George

KNIGHTHOOD: MANTLES AND INSIGNIA OF THE PRINCIPAL BRITISH ORDERS OF KNIGHTHOOD

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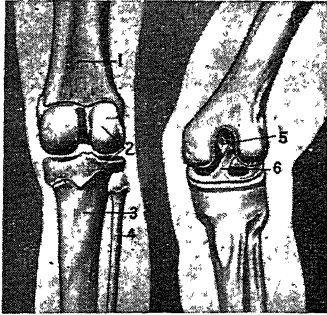
This picture, after a painting by A. Chevallier Tayler, illustrates the traditional incident at the court of King Edward III from which originated the institution of the Order of the Garter. The king picks up a garter accidentally dropped by the Countess of Salisbury and utters the words "Honi soit qui mal y pense," later adopted as its motto by the order



On the eve of taking his knightly vows, the medieval novice spent the night in prayer. This well-known picture by John Pettie, R.A., now in the Tate Gallery, shows the warrior, fully clothed and with drawn sword, on his vigil

KNIGHTHOOD: TWO ARTISTS LOOK BACK TO THE ROMANTIC AGE OF CHIVALRY

devised. If these are not satisfactory, operative treatment should be adopted. Very similar symptoms are produced by a loose body in the joint, which may be a portion of cartilage which has been broken off by an accident, or a cartilaginous nodule which has developed in the



Knee-joint. Sectional diagrams showing, left, the joint of right leg from back; right, position of ligaments. 1. Femur. 2. Epiphysis. 3. Tibia. 4. Fibula. 5. Posterior and 6. anterior crucial ligaments

synovial membrane lining the joint, or a fibrinous exudation in chronic tuberculosis. Treatment consists in opening the joint and removing the foreign body. This condition may be difficult to distinguish from displaced semilunar cartilage.

Acute arthritis of the knee-joint may be the result of infection from without following an injury, or from within when micro-organisms are present in the blood-stream, as in pyaemia (a form of blood poisoning), or certain cases of gonorrhoea. The symptoms are acute pain, heat, and swelling of the joint. Suppuration may lead to serious mischief and deformity. Treatment consists in opening the joint, cleaning it, and inserting drainage tubes to allow free discharge of the infected material. Chronic arthritis may follow the acute form, or may be the result of acute rheumatism and other diseases. Treatment depends upon the stage and severity of the disease. In some cases, rest of the joint may be desirable; in others exercises, passive movements, and massage. Hot air baths are often useful.

Tuberculosis of the knee-joint may arise apparently spontaneously, or may follow some slight injury to the joint. A family history of tuberculosis may be present, and the patient is often in poor general health. The onset is usually insidious, some impairment of movement and pain being frequently the first signs. At a later stage the knee is white, smooth, and swollen. Fluid and material collect in the joint, with the forma-

tion of a form of abscess which was formerly termed a "cold" abscess. Ultimately, there may be complete disorganization and deformity of the joint. The condition in the early stages can often be completely cured by keeping the limb absolutely at rest by means of splints or casings of plaster of Paris, and at the same time building up the general health of the patient. Abscesses may require draining. In some cases it is necessary to open the joint and remove the diseased material, or even parts of the bone, and in serious cases amputation of the limb is necessary.

Syphilitic disease of the joint may occur in either the acquired or inherited form of the disease. Inflammation and arthritic changes occur. Treatment is directed towards the constitutional condition. "Charcot's Disease" of the joint may occur in the course of locomotor ataxia. The joint rapidly becomes atrophied and useless. Not much can be done by treatment, and in some cases amputation of the limb is necessary.

Kneeling. Attitude instinctively adopted among all peoples in token of submission to a conqueror, humility before an overlord, or supplication for a boon. It is one of the two postures of reverence intimately associated with the ceremonial of all religions, standing being the other. Standing, always regarded as the proper attitude for praise, was also used as a posture for prayer, and was perhaps the more common one in the early Christian Church. Kneeling in prayer, though not prescribed by the Mosaic law, was practised by the Jews from very early times. The invitation "let us kneel before the Lord our maker" occurs in Ps. xcv, 6. Solomon knelt at the dedication of the temple (1 Kings viii, 54). Other O.T. references to the practice are Isaiah xlv, 23, and Dan. vi, 10. Kneeling was the attitude adopted by Jesus (Luke xxii, 41), by His disciples (Acts vii, 60; ix, 40; xx, 36), and by the early Christians in general, except on Sundays and in the interval between Easter and Whitsuntide, when standing at public prayer was prescribed as a testimony of joy.

About the time of the Lateran Council, 1215, or even earlier, the claim of Divine adoration was made as being due to the Elements at the Eucharist from the moment of their consecration. The English Church alone of all churches throughout Europe made no recognition of that claim in her regular, written, and authorised ritual, and the direction embodied in the rubrics of all other churches

and monastic bodies of the West, for the celebrant to kneel and worship the Element, never found footing in the English Church. The Prayer Book of 1552 contained a specific declaration that the order to all communicants to receive the Elements kneeling did not necessarily imply a real and essential presence of Christ in the sacrament. The substitution in 1662 of the word "corporal" for "real and essential" finally defined the teaching of the Church of England.

Kneller, Sir Godfrey (1646–1723). German painter, whose real name was Gottfried Kniller. Born



Self-portrait

at Lübeck, Aug. 8. 1646, and intended for a soldier, he insisted on becoming an artist, studied at Amsterdam under Ferdinand Bol, and received some lessons from Rembrandt. At first he meant to paint history and Scripture subjects, and spent some time in Rome, studying Raphael. But a visit to Venice, where he was impressed by the works of Titian and Tintoretto, diverted his attention to portraiture. On his father's death, 1675, he came to England, where he built up a lucrative connexion after painting the portrait of Charles II (1678). He also painted portraits of James II, William III, Queen Anne, and George I, and succeeded Sir Peter Lely as court painter (1680). Peter the Great and Louis XIV also sat to him.

His most notable works include the equestrian portrait of William III, the portraits of Queen Anne, the duchess of Marlborough, Newton, the duke of Monmouth after execution, and 48 celebrities of the Kit-Cat Club. Assistants painted in the backgrounds, dresses, and hands. He was knighted in 1691 and died in London, Oct. 19, 1723, being buried at Whitton, Middlesex. See Anne; Betterton; Congreve, W.; Dryden; George I; Gibbons, G.; James II; Jeffreys.

Kneller Hall. Mansion built for Sir Godfrey Kneller in 1709, near Hounslow, Middlesex. Here the Royal Military School of Music was established 1857 for training bandmen for the British army. There are two classes: one of students for the post of bandmaster, and who attend for two years; the other of boys and men under training as soloists for the regimental bands, attending for

one year. The administration is strictly military, under a colonel as commandant. Under him is a major, the musical director, and a staff which includes an adjutant, quartermaster, chaplain, and the schoolmaster. The organization of Kneller Hall has been copied in America, the first director of the U.S. school of army music being one of its graduates.

Knickerbocker. Term given to families in New York who are descended from the old Dutch settlers. The name Knickerbocker actually appears in old records, and it was popularised in Washington Irving's Comic History of New York, which purported to have been written by a Diedrich Knickerbocker. The term as applied to a garment is derived from that worn by a character in this work.

Knight. One who has received the honour of knighthood (*q.v.*).

Knight. A piece in chess. It moves two squares in a straight line and then one diagonally to left or right, so that a knight in the middle of the board commands eight squares. It is the only piece that may leap over others of its own colour or hostile. *See Chess.*

Knight, CHARLES (1791-1873). British publisher, editor, and author. He was born at Windsor,



Charles Knight,
British publisher

March 15, 1791, and with his father started The Windsor and Eton Express in 1812. Helped by J. W. Croker, the younger Knight began as a publisher in 1823, start-

ing Knight's Quarterly Magazine, the contributors to which included Praed, Macaulay, and De Quincey. As publisher or editor during 1829-46 of the works of the Society for the Diffusion of Useful Knowledge, his name is associated with The Penny Magazine, The Penny Cyclopaedia, The English Cyclopaedia, etc.

His own writings include Lives of Caxton, Fairfax, Shakespeare, and Tasso; Popular History of England, 2 vols., 1862; Passages of a Working Life, 1864; Shadows of the Old Booksellers, 1865. In 1860 he was appointed publisher of The London Gazette, and he died at Addlestone, Surrey, March 9, 1873. Knight deserves recognition as a pioneer in producing cheap and wholesome reading for the masses. A sketch by A. A. Clowes appeared in 1892.

Knight, DAME LAURA. British painter. Born at Long Eaton, Derbyshire, Laura Johnson studied

painting at Nottingham school of art, and first exhibited at the Royal Academy in 1903, in which year she married a fellow-student Harold Knight (born 1874; A.R.A., 1928; R.A., 1937) who became a distinguished painter of portraits and interiors. Examples of Laura Knight's work are in the Victoria and Albert and British Museums and in many public galleries in England, South Africa, Australia, and the U.S.A. In 1927 she was elected A.R.A., being the first woman associate since 1769, and in 1936 became R.A. She was created D.B.E., 1929. A robust, direct painter, whose most notable contribution to the art of her time lay in the portrayal of circus and stage characters and scenes, she published her memories, Oil Paint and Grease Paint, 1936.

Knighthood (A.S. *cnihtad*, from *cniht*, youth, and *had*, condition). Character or dignity of a knight, an order of chivalry. Although ultimately an office closely linked with the Christian church and with feudalism, knighthood originated amongst the pagan Germanic tribes, with whom it was customary for the young warrior first to prove himself in battle, then to attend a tribal ceremony at which his chieftain presented him with a sword and shield. With the growth of German nationalism and the spread of Christianity, knighthood acquired a religious significance, and 9th cent. chronicles frequently refer to the solemn arming of young nobles and their swearing fealty to

prince and church. The wars against the Saracens, with their religious basis and their emphasis on the use of cavalry, gave further impetus to knighthood, which was inevitably conferred upon young men politically, economically, and socially superior to the foot soldier.

From its origin as the office of a youth apprenticed to the profession of arms, knighthood evolved into the dignity of an attendant upon nobles and great officers of state. This personal relationship was later strengthened by the institution of feudal tenancy, by virtue of which the knight held land in return for military service to an overlord.

In England, from the time of William the Conqueror, the military strength of the kingdom was measured by the number and



Dame Laura Knight,
British painter



Laura Knight. Dressing for the Ballet, an example of this artist's many "back-stage" paintings
Reproduced by permission

soldierly efficiency of the knights whom the king was able to summon to the field. At that time a knight was a man holding land in fief with the obligation of performing military service for the sovereign, and the office had now no great religious significance.

With the Crusades, however, feudal obligations ceased to be the governing factor in the conferment of knighthood, and the church played a prominent part in the formal investiture of knights, so laying the foundations of the orders of chivalry. A feudal fief was no longer necessary for

knighthood as it was for nobility in a political sense. Knights without fief were known as knights bachelor, a term that survives.

Knighthoods conferred under the aegis of the church were of two kinds: the accolade as awarded to laymen, and the receiving into one of the military religious orders of men who were monks as well as soldiers. The ceremony of initiation was elaborately religious for each, and among the formal services of the church was one for the making of a knight. The usual ceremony began with an all-night vigil by the aspirant before the altar on which his arms were laid. He then underwent ceremonial purification in a bath, hence the origin of the present knighthood of the Bath. Thus prepared, he attended mass, after which sword and spurs were conferred upon him and he took the knight's oath.

Similarly the church prescribed the terms of the knightly ideal, which, as recorded by John of Salisbury in 1165, were to protect the church, to fight against treachery, to reverence the priesthood, to fend off injustice from the poor, to make peace in your own province, to shed your blood for your brethren, and, if need be, to lay down your life. Should a knight infringe or break his oath, he was degraded by having his spurs chopped off, his sword broken, his escutcheon reversed, and his armour stripped from him piece by piece.

Soldiers of the Cross

Institution of the strictly religious orders of the knights Templars and Hospitallers was a direct outcome of the crusades. Members were pre-eminently soldiers of the cross. Their primary object being to repulse the infidel, their orders became cosmopolitan, and the order of knighthood was conferred upon commoners, princes, and kings irrespective of any property qualification.

When it was strictly a military and religious organization, knighthood was essentially a guild of soldiers, and, as such, inspired by the freemasonry of all medieval guilds. All knights were brothers everywhere, and even when engaged in opposite sides in war observed an international freemasonry. After a hard battle the knights would be spared, whereas the common soldiers were often slain by the victors.

For some three centuries the knights of chivalry and the knights of feudalism existed to-

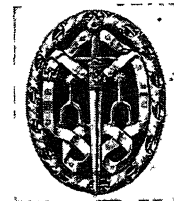
gether, but eventually their status declined, and even by the time of Froissart was in decay. The social class from which military knights were mainly drawn was gradually submerged; their wealth had consisted in land, which became more and more subdivided. Moreover, the original tenets of knightly purity ceased to be strictly observed, and the honour ceased to attract men as a dedication to service.

Property Qualifications

With the rise of a mercantile class in the 14th cent., property became the main qualification for a knighthood; and eventually all persons who held property to the annual value of £20 were obliged to take up the honour, for which they had to pay appropriate fees. Towards the close of the Middle Ages knighthood had fallen into such low estimation that kings were frequently obliged to compel qualified property owners to become knights, and pay the appropriate fees, or to compound for a fixed sum. This process of extortion by compulsory knighthood was one of the devices used by Charles I to raise money without resorting to parliament, with the result that during the Commonwealth an act was passed abolishing the prerogative of knighthood.

In its purely military sense knighthood ended in England with the Hundred Years War, which was fought for national prestige rather than personal glory; while the introduction of gunpowder dealt a mortal blow to the knight as a military force. Nowadays knighthood is conferred without regard to property, and is simply a mark of the sovereign's esteem or a recognition of service of some kind to the crown or the community.

Rules for existing British orders of knighthood and for new orders have been drawn up since the 17th cent. Two kinds of knighthood



Knighthood.
Badge of a Knight
Bachelor

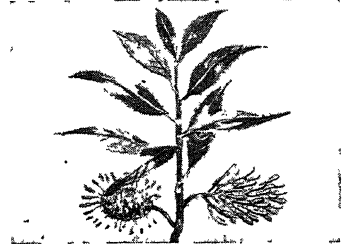
are now conferred by the British sovereign: knights who belong to one of the various orders, and knights bachelor, who do not belong to an order. There are nine orders of British knighthood; in order of precedence they are: Garter (1349), Thistle (1687), St. Patrick (1788),

Bath (1399), Star of India (1861), St. Michael and St. George (1818), Indian Empire (1877), Royal Victorian (1896), and British Empire (1917). All who belong to the orders of the Garter, the Thistle, and St. Patrick are knights; the other orders include companions or members who are not knights.

In the U.K. and throughout the British Empire, a knight is entitled to the prefix Sir before his first name, and his wife is called by courtesy Lady, her legal title being Dame (*q.v.*). The dignity of knighthood is not hereditary, and a knight (unless he is already or becomes a peer) is still a commoner, but takes precedence over esquires and others without titles. The sovereign usually administers in person the accolade (*q.v.*) conferring knighthood: this ceremony is the sole remaining link with knighthood's military origin.

Of foreign orders of knighthood, that of the Holy Ghost, now a papal order but founded by Henry III of France, and the Order of the Golden Fleece, which has both a Spanish and an Austrian branch, are the most distinguished. The disappearance of many royal houses during the 20th cent. led to the disappearance of a number of Continental orders of knighthood. See *Knights of Columbus*; *Knights of Labor*; *Golden Fleece*, *Order of*; *Malta*, *Knights of*; *St. John*, *Knights of*; and entries on the various British knighthoods: *e.g.* Bath; Garter; Michael and George. See also col. plate, facing p. 4868.

Knightsia excelsa. Tall evergreen tree of the family Proteaceae, native of New Zealand.



Knightsia excelsa. The foliage and flowers of this New Zealand tree

It has leathery, lance-shaped, coarsely toothed leaves, and the small flesh-coloured flowers, which have no petals, are crowded in large, velvety, oval clusters from the base of the leaf-stalks. The wood has a straight grain and is easily split; it is mottled with red and brown, and is prized for furniture making and similar uses.

Knightlow. Hundred of Warwickshire, England. It is noted for its hundred moot, still held every year on Nov. 11. The steward of the duke of Buccleuch assembles the representatives of the various parishes round a hollow stone, on the top of Knightlow Hill, and reads out the names of the parishes in the hundred and the amount of money due from each, which is cast into the hollow stone.

Knighton. Market town and urban dist. of Radnorshire, Wales. It stands on the Teme, 17 m. W. of Ludlow. Near are remains of Caractacus's Camp and Offa's Dyke. Pop. 1,836.

Knights, THE. A comedy by Aristophanes, produced 424 B.C. It is a bitter attack on Cleon (*q.v.*), represented as a Paphlagonian slave who by his effrontery has succeeded in gaining control over an Athenian householder named Demos, *i.e.* the people. Cleon is finally overcome by an even more brazen-faced sausage-seller. In *The Knights*, which gained the first prize at the Dionysia, the poet himself took the part of Cleon.

Knightsbridge. London thoroughfare. It runs between Hyde Park Corner and the junction of Brompton Road and Kensington Gore, S. of Hyde Park. Charles Reade lived at 70, Knightsbridge, 1867-79. At 49, Prince's Gate, the Peacock Room was decorated by Whistler in 1876-77.

The red brick cavalry barracks date from 1879; the riding school from 1857. Near Brompton Road is an equestrian statue of Lord Strathnairn by Onslow Ford, erected in 1895. Another local feature is the horse mart of Tattersall's (*q.v.*). Knightsbridge, which once had a turnpike, is supposed to derive its name from a bridge over the Westbourn in the old manor of Neyte.

Knightsbridge. The name given by the British during the North Africa campaign of 1942 to a track junction in the Western Desert, about 35 m. S.S.W. of Tobruk. A defence "box" was established there and, manned by the 201st Guards brigade, held out against vastly superior forces from May 28 until June 15, when the Guards were withdrawn to Tobruk.

Knight Service. System by which, in the Middle Ages, men held land in return for supplying the king or overlord with a certain number of knights in the event of war. The system probably grew up in France and was introduced into England by William the Conqueror, although there is evidence



Knightlow, Warwickshire. Hollow stone on Knightlow Hill in which the ward money is cast

of something of the kind in Anglo-Saxon times. There was no hard and fast rule about the number of knights to be supplied from a certain extent of land, but they were usually in units of five or ten. The service was by custom limited to 40 days a year, and it was contended, notably by Hugh, bishop of Lincoln, in 1197, that ecclesiastical lands were not liable to provide knights for service abroad. Knight service also included the duty of guarding the lord's castle for a certain period.

Knight service became less important as foot soldiers began to play a more prominent part in warfare. The system was virtually destroyed when landholders were allowed to commute their services for money, a process that began in the time of Henry II. It was not formally abolished, however, until 1660. See Feudalism.

Knight's Fee. Name given in England in feudal times to the amount of land which formed the unit of military service. William the Conqueror let out the land of his kingdom to his followers on condition of such service, and there is reason to believe that the unit was a piece of land which provided five knights. This, however, is not certain, and the size and duties of the fee probably varied very much; the king got as much as he could from the tenant, who on his part tried to reduce his obligation. The fee may have been the equivalent of the five hides necessary to make a man a thegn in Anglo-Saxon times, or it may have been land worth £20 a year. The number of knights available under this system is estimated at about 6,000 or 7,000. The relief paid on inheriting a knight's fee was 100 shillings. With other feudal customs this obligation, having fallen into disuse, was abolished in 1660.

Knights Hospitallers. Orders of knighthood originally founded as charitable bodies for the care of the poor and sick in hospitals. Among the most famous are the Knights of S. John of Jerusalem (*see* St. John). Other such orders were the Knights Hospitallers of the Holy Spirit, the Hospitallers of Our Lady of Christian Charity, and the Teutonic Knights.

These last originated in 1190, when certain North German merchants in the Holy Land, concerned at the sufferings of the Christians before Acre, erected a tent-hospital to care for them, on the lines of the German hospital already existing at Jerusalem. The members bound themselves in a monastic order, recognized by the pope; in 1198 they became a knightly or military order. For 200 years they waged war against the heathen in Prussia and Lithuania, but as these were subdued and converted the order began to decline. In 1466 they suffered at Tannenberg, at the hands of the Poles and Lithuanians, a defeat from which their prestige never recovered. In 1525 the order was secularised. It was wholly suppressed in the German states under Napoleon. It survives in a limited form in the Netherlands and in Austria, where it carries on charitable works on the lines of the Order of S. John, in Great Britain.

Knights of Columbus. Benevolent and fraternal association in the U.S.A. It was founded in 1882 by the Rev. M. J. McGivney at New Haven, Conn., where it still has headquarters. It consists of Roman Catholics only. The objects are to protect and extend the interests of their Church, promote social intercourse among members, and assist them in need. Membership in 1947 exceeded 575,000. The society has branches in Canada and other countries.

Knights of Labor. American labour organization. It was started in 1869 by a few workers in Philadelphia, and until 1882 was a secret society. Open to all workers, its membership increased rapidly. The knights advocated equality of sexes, common ownership of land and railways, and compulsory arbitration. At one time the society had 700,000 members, but it declined in numbers after 1885.

Knights of S. Columba. A fraternal association of Roman Catholic men in Great Britain. It had an elaborate organization, with a central administration under a general master workman.

Founded in 1919 in Glasgow, in admiration of the war work in Europe by the Knights of Columbus, the organization has 370 subordinate councils in the U.K., Channel Islands, and Malta. Aims are to promote R.C. interests and in particular the moral, intellectual, and material welfare of members. The bishop of Lancaster acts as ecclesiastical adviser. During the Second Great War the K.S.C. maintained services' clubs, and in 1947 set up a club in London. Headquarters remain at 81, Berkeley St., Glasgow, C3.

Knight's-star Lily (*Hippeastrum*). Genus of bulbous herbs of the family Amaryllidaceae, natives of S. America. They have strap-shaped leaves, and small clusters of large funnel-shaped, lily-like flowers of orange, crimson, or white, striped and mottled with various tints. Long cultivated in greenhouses, they have given rise to many florists' varieties and hybrids.

Knights Templars OR **KNIGHTS OF THE TEMPLE**. Religious and military order founded at Jerusalem about 1118. Its founders were Hugh de Payens, Geoffrey of St. Omer, and seven others. The rule, drawn up by Bernard of Clairvaux, enjoined chastity, poverty, and obedience. The object was the defence of pilgrims to the Holy City. The name was derived from the quarters in the palace known as Solomon's Temple at Jerusalem, granted to the order by Baldwin II. There were three grades—knights, esquires, and those who helped with gifts. At first they made their religious vows to the patriarch of Jerusalem, and until 1128 membership was confined to the original nine. Then, at the council of Troyes, Honorius II confirmed the rules, and the order quickly increased in wealth, numbers, and privilege. The numbers at the end of the 13th cent. were about 15,000, while property included 9,000 castles and manors.

The mantle was white: in 1146 Eugenius III added to it a red cross. In 1172 the order was made answerable to the pope alone. The seal represented, as an emblem of poverty, two knights riding a single horse. The black and white banner bore the legend *Beaucéant* (Prov. *baucan, balzan*, black horse with white marks on foot). The motto was *Non nobis, Domine, non -nobis, sed nomini tuo da gloriam* (Not unto us, O Lord, not unto us, but to Thy name give the glory). In the East the order had stations at Jerusalem, Antioch,

Tripoli, and Cyprus; it had provinces in nearly every country in W. Europe; the head of the order



Knights Templars. Effigy in Temple Church, London

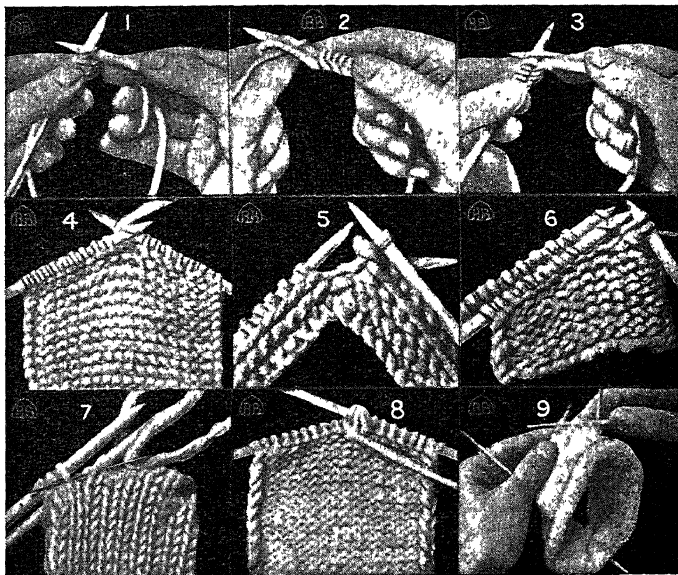
Clement V, who owed his office to the French king, the order was suppressed at the council of Vienne, 1312, many members being subjected to torture and burnt to death, while the property of the order was confiscated. Vestiges of the order remain in several place-names in England, e.g. The Temple, London; Temple Brewer, Lincs; Temple Newsam, Leeds; Temple Cowley, near Oxford; and several round churches help to preserve their memory. See Banner; Crusades; Temple.

Knipperdolling OR **KNIPPERDOLLINCK**, BERNHARDT (c. 1490–1536). German Anabaptist. A

prosperous cloth merchant, he joined Matthys and Bockelson when they seized his native Munster in 1532. In 1534, on the death of Matthys, Bockelson became king of the New Zion, and Knipperdolling his vice-steward and guardian of public order. His sympathy with the insurgents was at first political, but he is said to have aspired to the kingship. Munster was recaptured by the prince bishop in 1535, and Knipperdolling, Bockelson, and their colleague Krechting were taken, exposed in cages, and on Jan. 22, 1536, executed. See Anabaptists.

B. Knipperdolling, German Anabaptist

Knitting (A.S. *cnyttan*, to knot). Method of making fabric with one thread. The art of hand knitting is believed to have originated in Scotland, and was introduced into England and France in the 15th century. A guild of knitters was formed in France about 1500. Knitting by hand is done with one thread and two or more needles, little rods of steel, wood, bone, or plastic. For flat knitting, only two needles are used; they are usually pointed at one end, and have a knob or disk at the other to



Knitting. 1. Position of the hands. 2 and 3. Methods of casting-on. 4. Plain knitting. 5. Casting-off. 6. Casting-off two needles together. 7. Grafting. 8. Purling. 9. Knitting in round. By courtesy of Patons and Baldwins, Ltd.

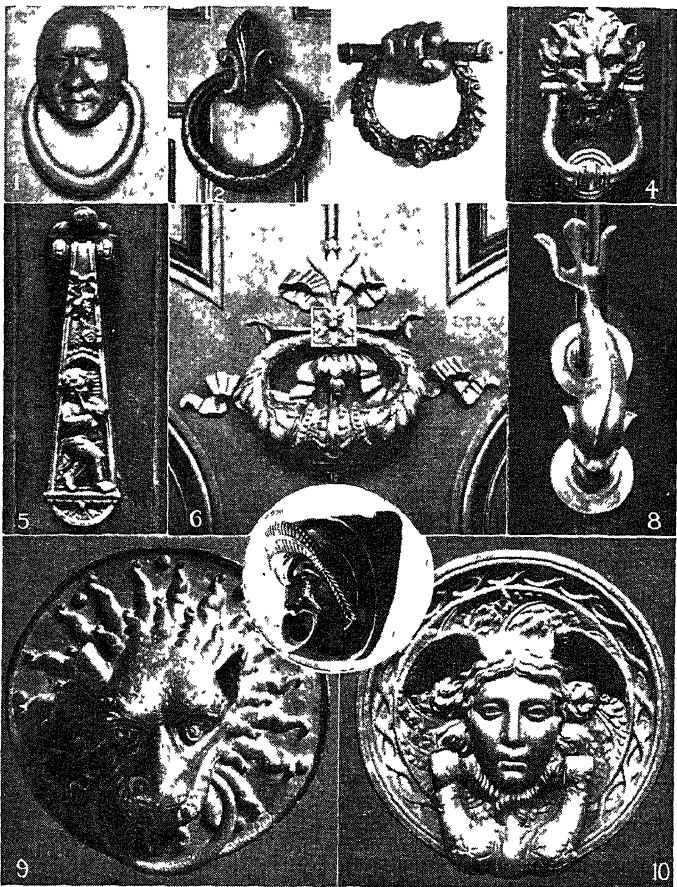
prevent the loops from slipping and are then, strictly, knitting pins. The wool or thread is cast on one needle in loops, the second needle casting a new row of loops into those already formed, slipping the latter off the first in the process. For a stocking or glove four needles (pointed at both ends) are usually needed, the loops being cast on three to form a circle, while the fourth is used to replace each needle in turn as a new row is made. But gloves or stockings can be knitted on two pins and seamed afterwards.

A knitting frame, invented by William Lee of Woodborough, was first used in 1589; this, with minor improvements, remained in use until 1758, when Jedediah Strutt added a ribbing machine to the frame. In 1828 the first steam frame was introduced for making stockings, which were woven in a straight piece and joined up the back. Articles made by knitting include stockings, gloves, jerseys, shawls, caps, much underclothing, and jersey cloth, the threads used being cotton, wool, artificial silk, or silk. Both Great Wars saw much knitting of articles for the services, coupon-free wool being issued in the U.K. both to individuals and to groups of knitters for this purpose in the Second Great War. See Hosiery.

Knoblock, EDWARD (1874-1945). British dramatist. Born in New York, April 7, 1874, he was educated at Harvard, and became a naturalised British subject in 1916 when he changed the spelling of his name from Knoblauch. After adapting *The Shulamite*, 1906, he became a reader of plays at the Kingsway Theatre. He established his reputation as a popular dramatist with *Kismet*, 1911. He wrote or adapted *Milestones* (with Arnold Bennett), 1912; *My Lady's Dress*, 1914; *Grand Hotel*, 1931; *The Good Companions* (with J. B. Priestley), 1931; *Evensong* (with Beverley Nichols), 1932. His reminiscences, under the title of *Round the Room*, appeared in 1939. He died July 19, 1945.

Knocke. A seaside resort of Belgium, in the prov. of W. Flanders, 5 m. E. of Zeebrugge. Troops of the Canadian 1st army fought their way into Knocke on Nov. 1, 1944, and captured the last of the German garrison on Nov. 3, concluding the battle of the Schelde "pocket."

Knocker. Piece of brass or iron suspended to an outer door, in order that a caller can make his



Knocker. 1. Knocker, formerly in Craven Street, which suggested to Dickens the face of Marley in *A Christmas Carol*. 2. Knocker of Dickens's residence, 48, Doughty Street. 3. Knocker of Dr. Johnson's house in Bolt Court. 4. Iron knocker at 10, Downing Street. 5. Cast-iron knocker in Salisbury Square. 6. Silver-bronze knocker. 7. Knocker designed by Sir L. Alma Tadema. 8. Rare antique dolphin knocker. 9. English knocker of 13th cent. 10. Knocker on the former Devonshire House, Piccadilly

presence known. The existence of a knocker implies that of a door-nail upon which the knocker strikes. In England, in the 18th century, houses of the wealthy were adorned with knockers (and accompanying door-nails) of fine workmanship, and collections of these have been made. Then young men of fashion found amusement in wrenching knockers from doors. In the 19th century the knocker was largely replaced by the bell, but it remained on many houses as an ornament. A knocker is also a name given to a goblin, who, it is said, lives in a mine and indicates the presence of ore therein by a knock. A knocker-up, particularly among Lancashire mill-workers, is a person who, in return for a small fee, knocks up the workers at a stated hour in the morning.

Knocking. Fault in an engine. It is due, either singly or in com-

bination, to excessive bearing clearances (at crosshead or gudgeon) or to unduly rapid rise of pressure in the cylinder. Excessive bearing clearance is the principal cause of steam-engine knocking. During the latter portion of the stroke the crosshead is slowing down, and the reciprocating parts require a negative force to slow them down also. Unless there is sufficient compression load to prevent it, the load on the crosshead pin is transferred from the top to the bottom and a knock may result. The higher the engine speed the greater is the liability to knock.

In petrol engines knock is generally caused by pre-ignition, due either to excessive spark advance or to overheated plugs or glowing particles of carbon creating hot points in the combustion space. This causes maximum

pressure to be attained before dead centre is reached. In compression-ignition engines (Diesel), premature injection of the spray of oil into the compressed and heated air in the cylinder prevents the vaporised oil being sufficiently heated for immediate combustion, and, a relatively large amount of oil vapour being present when combustion begins, an explosive mixture is formed to create a rapid increase of pressure resulting in a knock. The incidence of Diesel knock depends primarily upon the vaporisation properties of the fuel and the timing of the injection pump. See Detonation.

Knock Knee (*Genu valgum*). A deformity in which the knees are bent inwards, so as to touch each other. The commonest cause is rickets during early life, but it may also develop in young adults whose occupation obliges them frequently to carry heavy weights. In young children, rest in bed, massage, and manipulation, help to straighten the limb. In older children it may be necessary to apply splints on the outer side of the leg. Appropriate measures must also be taken to deal with rickets, if that is the underlying cause. See Bow-Leg; Knee.

Knockmealdown. Mt. range of Eire which extends for about 13 m. between cos. Tipperary and Waterford. The highest summit attains 2,617 ft. This Old Red Sandstone ridge lies in an E. to W. direction parallel with the course of the middle Blackwater, of which it is the watershed.

Knole. Seat of Lord Sackville, in Kent, 1½ m. S.E. of Sevenoaks. Regarded as one of the finest houses in England, it was first a residence of the earl of Pembroke. In the 15th century it was bought and largely rebuilt by Bouchier, archbishop of Canterbury. Later archbishops lived here until the house and estates were taken from Cranmer by Henry VIII. Elizabeth gave them to Thomas Sackville, afterwards earl of Dorset. The present structure was built early in the 17th century: its

chief features are the great hall, dining-rooms, and several galleries. It contains valuable works of art, and stands in a large deer park. Of the older house, the remains include a chapel named after Bouchier.

The house belongs to the National Trust, Lord Sackville retaining the lease of part of it. The park is his property. Victoria Sackville-West, who was born here, gives a picture of Knole in *The Edwardians*, 1930.

Knoll (A.S. *cnol*). Name used to denote a small elevation of earth; the brow, crown, or summit of a hill; or a rounded hill of small dimensions. Brent Knoll in N. Somerset, is a good example.

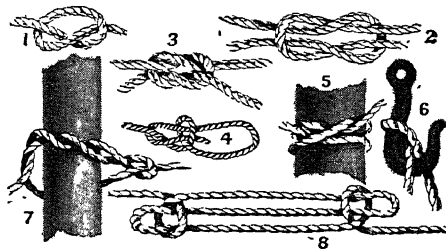
Knollys. Name of a famous English family, once the holders of the earldom of Banbury. Sir Thomas Knollys, lord mayor of London (d. 1435), was its founder. Sir Francis Knollys was prominent in the time of Elizabeth. His estates in Oxfordshire passed to his son William, who was made Viscount Wallingford and in 1626 earl of Banbury. He married Elizabeth Howard, a daughter of the earl of Suffolk, and over the paternity of her two sons a famous peerage case arose. It was decided that Edward was the rightful earl, but a writ of summons was refused, after his death, to his brother Nicholas. Neither he nor the next three earls were allowed to sit in the house of lords, and in 1813 the house definitely decided against the claim of William Knollys to be the 7th earl. The family then ceased to assume the title. *Pron.* Noles.

Knollys, FRANCIS KNOLLYS, 1ST VISCOUNT (1837-1924). A British courtier. He was born July 16, 1837, descended from the family that until 1813 claimed the earldom of Banbury. In 1868 he became gentleman usher to Queen Victoria, and in 1870 private secretary to the prince of Wales. He was holding this position when Edward ascended the throne, and acted in the same capacity throughout the reign (1901-10). He also served George V until his resignation in 1913. He was a lord-in-waiting to Queen Alexandra. Having been a knight since 1886, he was created a baron in 1902 and a viscount

in 1911. He died on Aug. 15, 1924. His son, Edward George William Tyrwhitt Knollys, 2nd viscount (b. 1895) was governor and c.-in-c. of Bermuda from 1941 to 1943, when he was appointed chairman of British Overseas Airways. That post he resigned in 1947 to become chairman of the Employers' Liability Assurance.

Knossus. Variant spelling of the Cretan town Cnossus (*q.v.*).

Knot. (1) Nautical measurement of the distance a ship travels in a certain time; so called from the early type of log line, which consisted of a length of cord having knots spaced at intervals. At the far end of the line was a sea-anchor device, and the speed at which the knots ran out over the stern as the vessel moved forward was timed against a 30-sec. hour-glass, the result being expressed in



Knot. Cordage knots in common use. 1. Overhand. 2. Reef. 3. Granny. 4. Bowline. 5. Clove hitch. 6. Blackwall hitch. 7. Timber hitch. 8. Sheepshank

knots, or nautical m.p.h. The knot is now the standard unit of ship speed and is expressed as such on mechanical logs.

It equals 6082.7 ft. per hour, or 1.1515 m.p.h., from which is derived the Admiralty standard of distance, the measured mile of 6,080 ft. Thus a rate of 30 knots represents a land speed of over 34½ m.p.h. Clearly it is incorrect to speak of so many knots per hour. In 1945 the R.A.F. adopted the knot and the nautical mile as standard measurement of speed and distance.

(2) In cordage a knot is a loop, or combination of loops, used for fastening two ropes together, fastening a rope to some object, or for making a knob or swelling in or at one end of a rope to prevent slipping, etc. Many knots are in use for specific purposes. The commonest is the overhand knot (Fig. 1). By making a second overhand knot over the first we get the reef knot (Fig. 2). A granny knot is similar to the reef knot, differing merely in the way the second knot is tied (Fig. 3), but it is unstable and can easily be pulled



Knole, the seat of Lord Sackville, Sevenoaks, constructed in the 17th cent. on site of earlier buildings

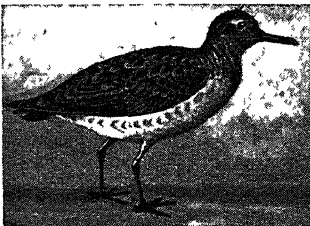
undone. The bowline knot (Fig. 4) has the advantage that it can quickly be unfastened and forms a loop which will not draw. The clove hitch (Fig. 5) is a useful knot for fastening a line, and has the advantage of holding very fast. It is among the best known knots. The blackwall hitch (Fig. 6) is useful for attaching a rope to a hook, the timber hitch (Fig. 7) for hoisting or towing heavy timbers, while the sheepshank (Fig. 8) is a knot used to shorten a rope when neither end is free. (*Consult* Book of Knots, C. W. Ashley, 1947.)

(3) A knot in wood is the hard portion due to growth of a branch.

(4) The word is also used metaphorically. e.g. a knot of people for a small group; a knotty point for a puzzling one. See Gordian Knot.

Knot (*Calidris canutus*). Small wading bird of the family Scolopacidae and the sandpiper section. About 9 ins. in length, it has long legs and a long, slender bill, and its winter dress is ashy-grey above and white below. In summer this is replaced by red-brown feathers with black centre above, while the lower parts are chestnut.

It is believed to spend the summer and to breed in the Arctic. In winter it migrates to the South, and from Aug. to Oct. numbers visit the E. and S.E. coasts of Britain, many of them staying until April or May. It frequents mud flats, and salt marshes, and



Knot. The small migratory bird in its summer plumage

feeds on molluscs. The name is said traditionally to be derived from Canute, who esteemed the bird for the table.

Knottingley. An urban dist. of the W. Riding of Yorkshire, England. It stands on the Aire, 3 m. N.E. of Pontefract on the railway. The chief industries are the manufacture of glass bottles, light engineering, electricity supply, and tar distilling. A canal connects the Aire at Knottingley, which is a river port, with Goole. The urban council owns the water supply. Pop. 9,000.

Knout (Russ. *knout*). Scourge formerly used in Russia for flogging criminals. The commonest

form of this whip consisted of plaited thongs of hide, sometimes interwoven with wire. Applied to criminals and political offenders, who were tied to stakes and stripped, the punishment was so severe that death often ensued. Flogging with the knout was finally abolished by tsar Nicholas I. See Torture.

Knowles (JAMES) SHERIDAN (1784-1862). British playwright. Born at Cork, May 12, 1784, son of James Knowles, lexicographer and cousin to R. B. Sheridan, he came to London in 1793 and met Hazlitt, Coleridge, and Lamb. He served

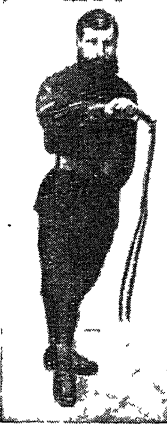


James Sheridan Knowles

in the army, was next an M.D. of Aberdeen, and became by turns actor, playwright, schoolmaster, lecturer, and miscellaneous writer. He was on the committee formed for the purchase of Shakespeare's birthplace, and, joining the Baptists in 1844, became a lay preacher. He died Nov. 30, 1862.

His first play, *Leo or The Gipsy*, 1810, was written for Edmund Kean. In *Virginius*, at Covent Garden, 1820, Macready played the title rôle. William Tell, notable for Macready's performance in the name part, followed in 1825. Knowles's first great success was with his comedy, *The Hunchback*, staged at Covent Garden, 1832, by Charles Kemble. For *The Wife*, 1833, Lamb wrote prologue and epilogue. A comedy, *The Love Chase* (Haymarket, 1837), is occasionally revived. A son, Richard Brinsley Knowles (1820-82), journalist and official of the Historical MSS. Commission, wrote a life of his father, rev. F. Hervey, 1372. *Consult* S. K. and the Theatre of His Time, L. H. Meeks, 1934.

Knowsley. The Lancashire residence of the earl of Derby, 8 m. E. of Liverpool. The estate came



Knout, once used for flogging Russian criminals

to the Stanleys before 1400 through the marriage of Sir John with the heiress of the Lathoms, and the original house was enlarged by the 1st earl of Derby, supporter of Henry VII. Subsequent earls added to and altered it, especially the 10th earl about 1700, and little of the original building remains. It is mainly built of red brick, and the S. and W. fronts are the most imposing; the latter consists of three blocks of equal height and size. It is surrounded by a park, 6 m. in circumference, and has many fine pictures and family portraits.

Knox, EDMUND (GEORGE) VALPY (b. 1881). British humorous writer. He was the eldest son of the Rt. Rev. E. A. Knox bishop of Manchester 1903-21. A younger brother was R. A. Knox (q.v.). Knox was educated at Rugby and Corpus College, Oxford. He joined



E. V. Knox, British writer

the staff of *Punch* in 1921, and was its editor 1932-49. Under the pen-name Evoc, he contributed witty articles and humorous verses, many of which were collected, e.g. *The Brazen Lyre*, *Parodies Regained*, *Fiction as She is Wrote*, *Fancy Now*, *It Occurs to Me*, *Awful Occasions*, *Slight Irritations*.

Knox, JOHN (c. 1514-72). Scottish religious reformer. He was born at Giffordgate or Morham, near Haddington, his ancestors having been feudal dependants of the earls of Bothwell. He was educated probably at Haddington grammar school and at St. Andrews university under Major. He took minor orders, and about 1540 was an apostolical notary at Haddington. When Wishart, the martyr, came to preach in 1545, Knox became his companion and definitely embraced the reformed faith. After the murder of Cardinal Beaton, Wishart's persecutor, Knox fled to the castle of St. Andrews, then held by the murderers, and was called to be preacher to the garrison. When the castle surrendered to the French in 1547 Knox was consigned to the French galleys, but was released in 1549 on the intercession of the English govt.

For the next five years he played a notable part in the Reformation under Edward VI as



a preacher at Berwick, Newcastle, and elsewhere, as a royal chaplain, and as the inspirer of the "Black Rubric" still retained in the Prayer Book to explain the significance of kneeling at Communion. After Mary Tudor's accession he visited Switzerland, and on Calvin's advice became minister to English refugees at Frankfurt, 1554. He left owing to disputes regarding the use of the Prayer Book, and was chosen pastor by English exiles at Geneva. After a visit to Scotland, where he imparted fresh vigour to the Protestant cause, he returned to Geneva in 1556. He enjoyed the "Rule of the Saints" and became imbued with that Calvinistic spirit which was to permeate the reformed church in Scotland. During 1559 he preached openly at Dieppe, and he finally returned to Scotland in May, summoned by Protestant nobles in arms against the regent, Mary of Guise. As "Lords of the Congregation" they were supported by their co-religionists. By stirring sermons at Perth, St. Andrews, and Edinburgh, Knox proved a host in himself; he also shared in negotiations which secured English aid.

The triumph of the insurgents was signalled by the treaty of Edinburgh, July, 1560, whereby the French troops left Scotland and a convention of the estates met to settle affairs. Papal authority was abolished, and Roman doctrine replaced by a Calvinistic Confession of Faith drawn up by Knox and his colleagues. But the cupidity of the nobles prevented the ratification of the First Book of Discipline—a unique scheme, embodying Knox's ideals, in which the revenues of the old church were claimed for the new, and for the promotion of the religious, moral, social, and intellectual well-being of the people.

The breach between the Protestant nobles and Knox was widened by the policy of the former on Mary's return to Scotland in 1561. Hoping she would be induced by the prospect of succession to the English throne to change her religion, they allowed her private celebration of Mass. Knox was persuaded that Mary was only biding her time to restore Catholicism, and from his pulpit in S. Giles church he denounced these compromises as subversive of the

Church, under the leadership of Knox, was recognized by the confirmation in parliament (1567) of the Acts of 1560 in favour of Protestantism.

In the civil war following Moray's assassination (1570) Knox opposed the queen's party, whose success would have undone his life's work. As they held Edinburgh Castle, he withdrew to St. Andrews. "Half dead" in body, but not in spirit, he returned to Edinburgh in Aug., 1572, preached his last sermon in S. Giles at his successor's induction, and died Nov. 24. A stone, inscribed "I. K. 1572," in the pavement of Parliament Square, formerly S. Giles churchyard, marks the supposed site of his grave.

Of the greatness of Knox there can be no doubt. He devoted himself to the mission to which he believed himself called with inflexible purpose, untiring zeal, practical shrewdness, unimpeachable honesty, and an earnestness saved from fanaticism only by a sense of humour. As the guide of the nation's destinies at the most formative period of its history, his countrymen have long assigned him a pre-eminent place among the makers of modern Scotland. The most important of his numerous writings is his *Historie of the Reformation in Scotland*. See Calvinism; Reformation; Scotland: History; also Edinburgh illus.

H. W. Meikle
Works, ed. D. Lang, 1846-64; Lives, T. McCrie, new ed. 1855; P. H. Brown, 1895; H. Cowan, 1905; Lord E. Percy, 1937; G. R. Preedy, 1941. J. K. and the Reformation, A. Lang, 1905; J. K., Portrait of a Calvinist, E. Muir, 1929.



John Knox. Two portraits of the Scottish reformer, by unknown artists

recent Protestant settlement. This led to his famous interviews with Mary, and to an estrangement between him and the chief Protestant noble, the earl of Moray. Mary's marriage to the Catholic Darnley effected their reconciliation, and when Moray was appointed regent, after the sensational events which led to Mary's abdication, the support given to the new government by the



John Knox preaching before Queen Mary and the Lords of the Congregation at S. Giles, Edinburgh. The scene as reconstructed by Sir David Wilkie

Knox, ROBERT (1641-1720). An English sailor. Born in London, Feb. 8, 1641, he was the son of a master mariner in the service of the East India Co. Sailing with his father on a voyage to India, he was shipwrecked on the shores of Ceylon in 1659, seized by the inhabitants, and kept in captivity for 20 years, during which time the father died. Knox escaped in 1679 and made his way to London where he told his adventures to Charles II. He afterwards commanded various vessels of the East India Co., engaged in slave traffic, and died in London, June 19, 1720. His *Historical Relation of the Island of Ceylon*, 1681, new ed. 1911, was the first detailed account of that island.

Knox, RONALD ARBUTHNOTT (b. 1888). British R.C. cleric and satirist. Born Feb. 17, 1888, he was a younger brother of E. V. Knox (q.v.). He went to Eton, and to Balliol, Oxford, where he became lecturer at Trinity College, 1910, and chaplain, 1912. Re-



Ronald Knox,
British satirist

ceived into the R.C. church, he became Catholic chaplain to Oxford, resigning to make a new Engl. trans. of the Vulgate (pub. 1946-49). From 1936 he was domestic prelate to the pope. His *Essays in Satire* (including a famous pseudo-news bulletin broadcast) appeared in 1928; *Caliban in Grub Street*, 1930; *Let Dons Delight*, 1939. Mgr. Knox wrote detective stories notable for wit and ingenuity. Contributions to theology are *The Mystery of the Kingdom*, 1928; *The Holy Bible: Abridgement and Rearrangement*, 1936; *God and the Atom*, 1945.

Knox, WILLIAM FRANKLIN (1874-1944). American journalist and politician. Born at Boston, Jan. 1, 1874, he was educated at Alma College. After serving in the Spanish-American war, he became a reporter, edited the *Boston American* for Randolph Hearst, and subsequently managed 27 daily newspapers. Purchasing the *Chicago Daily News*, with which he attacked the New Deal, he had by 1936 become Roosevelt's most formidable opponent. The Republican party nominated him for vice-president. In 1940 Frank Knox became secretary of the navy. He introduced a pro-



Knucklebones used in ancient Greece (half actual size); top, women playing at knucklebones, from a painting in the Herculaneum
By courtesy of the trustees of the British Museum

gramme of expansion, which made the U.S. navy the strongest in the world before he died at Washington, D.C., April 28, 1944.

Knox, FORT. American army post and gold depository. This 33,000-acre military reservation in Hardin co., Ky., forms the site of the bullion depository which the U.S. government constructed to store from 1937 the nation's gold reserve, then valued at about £2,500,000,000. After the Second Great War the government stored £3,125,000,000 of the country's gold reserves, which then totalled \$5,441,215,000—about three-fifths of the world's reserves. The depository consists of a bomb-proof concrete building, 100 ft. square, the walls and roof of which are faced with granite blocks, containing a vault of concrete and steel which can be flooded. Mechanised cavalry provide a permanent guard.

Knox Land.

Part of Antarctica lying E. of Queen Mary Land in the Australian sector, between the meridians 102° and 110° E. See Antarctic.

Knoxville. City of Tennessee, U.S.A., the co. seat of Knox county. On the Tennessee river, it is 160 m. E. of Nashville, and is served by the Louisville and Nashville and other rlys., and by steamers which can reach the city nearly all the year. Situated in a fertile and beautiful region, it is one of the healthiest cities in the state, and is the seat of the university founded 1794; also of Knoxville College for coloured

students, the state medical college, and the state agricultural college. Other buildings include the court house, city hall, Lincoln Memorial Hospital, and the Lawson McGhee library.

A flourishing commercial and industrial city, Knoxville trades in the noted Tennessee marble, coal, zinc, copper, iron, and agricultural produce, and manufactures cotton and woollen goods, furniture, foundry and machine shop products, flour, bricks, and cement. Settled in 1786, it was the capital of the state from 1811 to 1817, and was chartered as a city in 1815. Pop. 111,580.

Knucklebones. Primitive game originally played with the knucklebones of a sheep. The object is to toss the five knuckle-bones, now usually stones, one after the other and catch them on the back of the hand. There are many variations and different kinds of throws, and the game, which was largely played in classical times, is probably the original of all dice games. Alternative games are Five Stones, Hucklebones, Jackstones, Dibs, and Chuckstones.

Knur and Spell. Game once popular with working men in Lancashire and W. Yorkshire. It is a species of trap and ball; the spell answering to the trap and the knur to the ball. The trap, an elaborate instrument fixed to the ground with a spirit level, contains a strong spring kept down by a trigger. At the end of the spring is a small brass cup to hold the knur, usually made of porcelain, weighing half an ounce, and having a diameter of one inch. The wooden instrument for hitting the knur when thrown up by the trigger is called a pommel; its striking end is rounded



Knur and Spell. Player about to strike trap trigger with pommel

on the back and flat on the front. The player touches the trigger and stikes the knur. The record drive is 314 yds. The game is played in Lancashire by teams.

Knutsford. Urban district and market town of Cheshire, England. It is 15 m. S.W. of Manchester, on the old Cheshire Lines rly., a favourite residential dist. for Manchester. It derives its name traditionally from King Canute, who is said to have passed a ford over a branch of

the river Birkin. A parish since 1741, it was for 22 years the home of Mrs. Gaskell, who made it famous as Cranford, was married in the parish church, and was buried in the little burial ground of Brook Street Chapel in 1865. The church of St. John the Baptist, 1744, was enlarged in 1879. Knutsford

was the birthplace of Sir Henry Holland (1788-1873). Near by are Tatton Park, Rostherne, with a beautiful old church; Peover Hall; the 13th century church of Lower Peover, restored 1852; and Tabley Hall, once the home of Sir Peter Leycester (1614-78), the Cheshire antiquary. Knutsford gives its name to a county constituency. Market day, Sat. Pop. 5,878.

Knutsford, HENRY THURSTAN HOLLAND, 1ST VISCOUNT (1825-1914). British politician. The son



Henry Holland, 1st Viscount Knutsford

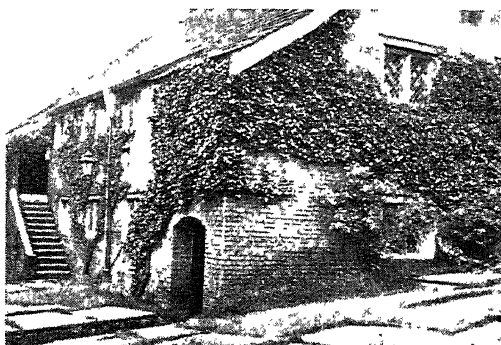
of Sir Henry Holland, the physician, and a grandson of Sydney Smith, he was born Aug. 3, 1825. Educated at Harrow and Trinity College, Cambridge, he was called to the bar in 1849, and in 1854 became legal adviser to the Colonial office. He sat as Unionist M.P. for Midhurst and for Hampstead, 1874-1888. In 1885 he was made financial secretary to the Treasury, and was secretary for the colonies, 1887-92. He was created a baron in 1888, and a viscount in 1895. He died Jan. 29, 1914, and was succeeded by his son, Sydney.

The 2nd Viscount Knutsford (1855 - 1931) was born March 19, 1855, educated at Wellington College and Trinity Hall, Cambridge, and became a barrister. He was chairman



2nd Viscount Knutsford

From a painting by Oswald Birley, now in the London Hospital board-room



Knutsford, Cheshire. Unitarian chapel described in Mrs. Gaskell's *Ruth*. The novelist and her husband lie in the adjoining burial ground

of the London Hospital from 1896 until his sudden death on July 27, 1931, and raised £6,000,000 in donations, earning the nickname of the "prince of beggars." The peerage came in 1935 to Thurstan Holland-Hibbert, 4th viscount (b. June 19, 1888).

Knysna. A river and town in Cape Province, S. Africa. The town is situated 4 m. from the sea, on a land-locked bay, 139 m. W. of Port Elizabeth. In the neighbourhood is the Knysna forest, where stinkwood and other trees are used in the manufacture of furniture. Knysna is a notable tourist and fishing centre. A national road and rly. have been opened to George. Pop. (white) 2,733.

Koala (*Phascolarctos cinereus*). A marsupial mammal. Found in Australasia, it is commonly called the native bear, though not related to the bear tribe. A thick-set animal about 2 ft. long, its fur is greyish in colour with white below. It has no visible tail. An expert climber, it spends most of its time in the eucalyptus or blue gum trees, and feeds on the leaves. It also eats roots, and is able to convey food in its large cheek pouches. The female carries her cub on her back for some time after it leaves her pouch.

Kobe. A seaport and city of Japan. It is situated at the W. end of the Inland Sea, on Osaka Bay, Honshu. There is rly. connexion with Osaka, 22 m. S.E. In 1868, when Kobe was founded, the site was occupied by a group of fishing villages. Shipbuilding, sugar refining, metal manufacture, and flour milling are chief industries.

Harbour improvements were begun in 1908, and large pieces of foreshore have been reclaimed and strong breakwaters constructed. Some 150,000 tons of shipping can now tie up at one time. Kobe exports more than Yokohama. but

imports less. It has direct steamship communication with the great world ports of the Pacific and N. Atlantic. In the Second Great War it was first bombed by U.S. aircraft on April 18, 1942; and military targets were attacked repeatedly in 1945, the city being severely damaged. After the surrender of Japan it was occupied by units of the U.S. 6th army. Pop. 788,000 See Hyogo.

Kobold (Ger.). A small tricky sprite or spirit of Teutonic folklore. He is similar to the Robin Goodfellow or the brownie of legends.

Koch. A name originally denoting an aboriginal tribe occupying the Ganges basin at the Aryan immigration. It dominated medieval E. Bengal and Assam, and its royal house survives in the ruling family of Cooch Behar. Now a semi-Hindu caste numbering about 370,000, it includes hinduised converts from the Garo, Mikir, and other Assamese tribes. The Bengali-speaking section numbers 2,000,000. *Pron.* Koss.



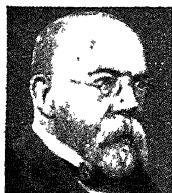
Koala. Specimen of the marsupial commonly called the native bear of Australia

Koch, LUDWIG (b. 1881). German-born ornithologist. Born Nov. 13, 1881, he was educated at Frankfurt, Paris, and Milan, and studied the violin until 1902. He then became a singer. It was Koch who made the first outdoor recordings of wild birds' songs. Coming to the U.K. in 1936, he became known for lectures, broadcasts, and films about bird song. He published *Animal Language* (with J. Huxley), 1938.

Koch, ROBERT (1843-1910). German bacteriologist. Born at Klausthal, Dec. 11, 1843, he

studied medicine at Gottingen university. In 1876 he investigated the causes of anthrax, and announced the isolation of the bacillus. In 1880 he became a member of the imperial board of health in Berlin, where he continued his bacteriological researches. In 1882, thanks to new methods of microscopical examination, he was able to announce the discovery of the tubercle bacillus, and in 1883, after a visit to Egypt and India, of the comma bacillus, the cause of the deadly cholera.

In 1885 Koch became professor in the university of Berlin, and director of the new hygienic institute. Thence in 1891 he announced his discovery of tuberculin, an antidote to tuberculosis.



Robert Koch,
German bacteriologist

Koch paid several visits to Africa to study rinderpest, sleeping sickness, etc. In 1905 he was awarded the Nobel prize for medicine. He died May 28, 1910. He ranks with Pasteur as the founder of bacteriology. Koch's chief works are *On Cholera Bacteria*, 1886; *On Bacteriological Investigation*, 1891. *Investigation of Pathogenic Organisms*, 1886. See *Bacteria*; *Tuberculosis*; consult biography by C. Wezel, 1912.

Kocher, EMIL THEODOR (1841-1917). Swiss surgeon. Born at Berne, Aug. 25, 1841, he became a specialist in operations for goitre and ruptures, and from 1872 was professor of surgery at Berne university. In 1909 he was awarded the Nobel prize for medicine. His best-known publications included *School of Surgery Operations*, 1892; *Encyclopaedia of Surgery*, 1902. He left important writings about operations after bullet wounds. Died July 27, 1917.

Kochi. Town and prefecture of Japan. The prefecture, also known as Tosa province, forms the S. portion of the island of Shikoku. Area, 2,800 sq. m. The chief products are sweet potatoes and the raw materials for Japanese paper: bonito fisheries are valuable. The town, formerly a feudal capital and now that of the prefecture, is centrally situated on the Bay of Urato. An electric rly. joins the

town to its port of Urato, whence steamers go to Osaka. Pop. 103,414.

Kock, CHARLES PAUL DE (1794-1871). French novelist. Born at Passy, May 21, 1794, he was of Dutch descent. His father was guillotined during the Revolution. He forsook a commercial for a literary career, and attracted notice with the first of his long succession of novels. *L'Enfant de ma Femme*, 1811. His works deal almost entirely with the life of the Parisian middle class, and their raciness gave them a vogue both in France and abroad which their literary merit hardly justified. Among the most characteristic may be mentioned *Gustave, le Mauvais Sujet*, 1821; *Le Barbier de Paris*, 1826; *Mon Voisin Raymond*, 1837; *Moustache*, 1838. His *Memoirs* were published in 1874, and he died in Paris, Aug. 29, 1871.

Kodaikanal. Hill station of India. It is 7,200 ft. above the sea in Madura district, Madras, among the Palni Hills. Some important researches in solar physics have been carried out at the observatory. Kodaikanal Road is some 40 m. to the E., a station on the rly. between Dindigul and Madura; passengers alight here for the hill station, which is reached by road through Periyakulam. Pop. 5,000.

Kodaly, ZOLTAN (b. 1882). A Hungarian composer. Born at Kecskemet, Dec. 16, 1882, he



Zoltan Kodaly,
Hungarian composer

studied at Budapest conservatoire, and in 1905 began his study of Hungarian folk music, tracing traditional melodies to their sources and collecting original songs from the peasantry. He found about 4,000 melodies, some of which he published jointly with Bartok. In 1906 he was appointed professor of composition at Budapest conservatoire, and in 1912 professor at the Liszt school of music. Kodaly's compositions are notable for their astonishing originality within the limits of tonality. They include string quartets, sonatas, songs, a setting

of Psalm 55, and the suite *Háry János*, 1927.

Kodiak OR KADIAC. Largest island belonging to Alaska. Lying off the E. coast and separated from the mainland by Shelikof Strait, it is about 100 m. long by 50 m. broad. Here is a base of the U.S. navy. The Karluk river abounds in salmon, and their canning is a valuable industry. There is an extensive trade in fur and cattle-rearing. The world's largest species of bear is found. Karluk, in the S.W., is the largest town.

Kodok. A town of Anglo-Egyptian Sudan, formerly Fashoda. It lies on an island in the White Nile, about 60 m. below the mouth of the Sobat. Its occupation by the French for a month in 1898 aroused hostile feeling in Britain; this was the Fashoda incident (*q.v.*).

Kodungalur OR CRANGANUR. Township of India, in Travancore-Cochin, 18 m. N. of Cochin. The Dutch took it from the Portuguese in 1661, Tippoo captured it in 1776 and destroyed it in 1789. Kodungalur has a pop. of 1,700 per sq. m. over an area of 19 sq. m. Rice and coconuts are the main crops. The rainfall averages 99 ins. annually.

Koenig, JOSEPH MARIE PIERRE (b. 1898). French soldier. Born and educated at Caen, the son of an Alsatian officer, he served in the infantry in the First Great War. He took part in the Narvik campaign, April, 1940, and fought in the Brittany peninsula after the German invasion of France. He escaped from France and joined Gen. de Gaulle in England; then he went to Eritrea and in N. Africa gained distinction for his defence of Bir Hakeim (*q.v.*). Promoted général de corps d'armée, he was in 1944 chief liaison officer between Gen. Eisenhower and the F.F.I., commander of the F.F.I., and following its liberation in Aug., military governor of Paris. After the war in Europe he became c-in-c. of French troops in Germany and military gov. of the French zone until 1949.

Koenig's Flame. Apparatus devised by a German physicist, Rodolphe Koenig (1832-1901). It consists of a metal chamber closed on one side by a flexible membrane subjected to the sound waves under investigation. Coal gas is fed into this chamber and passes out into a pin-hole burner; the flame issuing from the latter will exhibit pulsations corresponding to the sound vibrations. These fluctuations in the length of the flame are rendered more distinct by a

four-sided mirror in which the flame will appear jagged or toothed, the number of teeth depending upon the frequency of the source. The existence of harmonics will be indicated by the presence of smaller teeth between those of the fundamental note.

Koestler, ARTHUR (b. 1905). Hungarian-born British writer. Born in Budapest, Sept. 5, 1905, he attended Vienna university, and was a foreign correspondent to newspapers in the Middle East. He went with the Graf Zeppelin expedition to the Arctic in 1931, travelled in Soviet Central Asia, 1932-33, and was News-Chronicle correspondent during the Spanish Civil War. Both Gen. Franco and the Vichy French government imprisoned him. Koestler's books, widely read in Great Britain and the U.S.A., include Spanish Testament, 1938; Darkness at Noon, 1940; Arrival and Departure, 1943; The Yogi and the Commissar, 1945; Thieves in the Night, 1946; Promise and Fulfilment (Palestine), 1949.

Koffiefontein. Town of the Orange Free State, S. Africa. It is 33 m. N.W. of Fauresmith, near the Riet river and on the rly. The town owes its existence to diamond mines in the neighbourhood. Dams have been constructed for irrigation. Pop. 2,521.

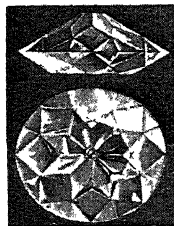
Kofu. Town of Japan. It is on the Fuji-Kawa, one of the three largest streams flowing to the Pacific coast of Japan, and is 70 m. W. of Tokyo, with which it has rly. connexion. It is noted for its silk market and grape culture. Tungsten is mined in the vicinity. Pop. 82,663.

Koga, MINEICHI (1885-1944), Japanese sailor, a native of Sagaken. He joined the navy in 1902, and was Japanese representative at the Geneva disarmament conference in 1932. At the outbreak of war in 1941 his fleet supported the Hong Kong and Malayan operations. In 1943 Koga became c.-in.-c. of the Japanese fleet until his death in action, March, 1944.

Kohat. Dist., subdivision, and town of Pakistan, in the North-West Frontier province. The area under cultivation is limited, wheat and millet being the chief crops. The district contains famous salt quarries. Kohat town is of little commercial importance, but strategically commands the Kurram valley and pass and is on the Thal rly., which crosses the Indus at Khushalgarh. Area of dist. 2,707 sq. m. Pop., dist., 289,404; town, 28,500.

Kohima. Town and district of Assam, India. The former stands near the river Dayang, in the Naga hills, 60 m. N. of Imphal. On March 17, 1944, the Japanese opened an offensive in Upper Burma, crossed the Indian frontier, and besieged Kohima. They failed to gain a foothold among the defences, while troops of the 14th army were clearing Japanese forces from the Kohima-Dumapur road and advancing on the town. On April 24 Kohima was relieved. See Burma Campaign.

Koh-i-Noor (Pers., mountain of light). Famous Indian diamond. Now part of the British regalia,



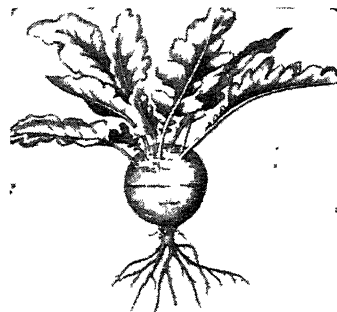
Koh-i-Noor. The famous diamond after its second cutting. Half actual size

Aurangzebe as an eye in the peacock throne, and passed in 1739 to the Persian invader Nadir Shah, who (according to the story), hearing that the diamond was hidden in the emperor's turban, suggested an exchange of turbans as a sign of reconciliation. Ranjit Singh acquired it in 1833, and after the annexation of the Punjab in 1849 it was presented to Queen Victoria, cut from 186 $\frac{1}{8}$ carats to 106 $\frac{1}{8}$, and shown at the Great Exhibition of 1851. It is now worn in the crown of the king's consort.

Koh-i-Nuh. Persian name for Mt. Ararat (*q.v.*).

Kohl (Arab. *kahala*, to stain). Powder used as a cosmetic by Oriental women to darken the orbits of the eyes. Introduced in Neolithic times, eye-paint became general in early Egypt, and its vogue spread thence to W. Asia, Greece, and Rome. It was used by Jezebel (2 Kings 9 v. 30). Eye-paints included green copper carbonate and such black metallic powders as antimony, sulphide, galena, and hematite, together with vegetable soot. The fashion survives among all classes, Copt and Muslim, in modern Egypt. Burnt almond-shells and gum libanum are favourite materials.

Kohl-rabi (*Brassica oleracea*, variety *CaULO-RAPA*). Variety of cabbage with the stem swollen at



Kohl-rabi. Variety of cabbage relished by stock

its base, just above the ground. It is a food relished by stock, while some kinds are adapted for human consumption. Tolerant of drought and cold, it is cultivated much in the same way as the turnip.

Kokoda. A locality in Papua (New Guinea). It is on the slopes of the Owen Stanley Mts., about 55 m. N.E. of Port Moresby. Kokoda was occupied by the Japanese after fighting with Australians in Aug.-Sept. 1942. On Nov. 2 the Japanese were driven out of the village and the threat to Port Moresby was removed. The road from Kokoda to Buna was built in 1904 to serve the Yodda goldfield.

Kokomo. A city of Indiana, U.S.A., co. seat of Howard county. On the Wild Cat river, it is 53 m. N. of Indianapolis, and is served by the Lake Erie and Western and other rlys. It trades in agricultural produce, and has lumber mills, steel and brass works, and potteries. It was settled in 1840 and incorporated in 1865. Pop. 33,795.

Koko Nor. Lake of China, in the prov. of Chinghai. The lake is a closed basin, at an alt. of 10,700 ft.; it is 65 m. long and 40 m. wide. Area, 2,300 sq. m. It lies S. of the Nanshan range, which reaches the borders of Kansu.

Kokopo. Capital and seaport of New Britain, Bismarck Archipelago. Situated in the N.E. of the island, it is 14 m. S.E. of Rabaul. Founded by the Germans in 1890 as Herbertshöhe, it was capital of their colony New Pomerania until 1910, when it was superseded by Rabaul. Captured by an Australian expeditionary force in 1914, it was included in the mandate over New Guinea granted to Australia in 1919. Kokopo was heavily raided by Japanese aircraft in Jan., 1942, and next month was occupied by land forces. The port was liberated by Australian and U.S. troops in April, 1944. In 1947 Kokopo was

selected to become the administrative capital of New Britain.

Kokra. The timber of *Aporosa roxburghii*, a tree of the family Euphorbiaceae, native of India. It



Kokra. Leaves and pod of the Kokra, a native of India

has laurel-like, leathery leaves, and flowers in catkins. The wood is hard, and useful for many purposes, including the making of musical instruments, such as flutes.

Koksoak. River of Canada. It drains the N. end of Labrador peninsula into Ungava Bay. It rises in Summit Lake, which has a double outflow; one by the Manikuagan to the St. Lawrence, the other by the Koksoak to Hudson Strait. The main stream, at first known as the Kaniapiskan, flows through Lake Kaniapiskan. The area of the basin is 62,000 sq. m., and the length 600 m.

Kokstad. Town of Cape Province, S. Africa. Named after the last Griqua chief, Adam Kok III, it is the principal town of Griqualand East, 26 m. S. of Franklin. The centre of a farming district, Kokstad has a town hall, agricultural hall, library, hospital, and churches. It is a branch terminus of the Natal rly. system. Coal and copper ores have been found in the neighbourhood. Pop 5,627.

Kokura. Town on the N. coast of Kyushu, Japan; a busy place straggling for miles along the shore. In feudal times Daimios held it as a fortified area guarding the approaches to the port of Shimonoseki. Later it became the garrison centre of imperial forces on duty protecting the straits. Pop. 173,638.

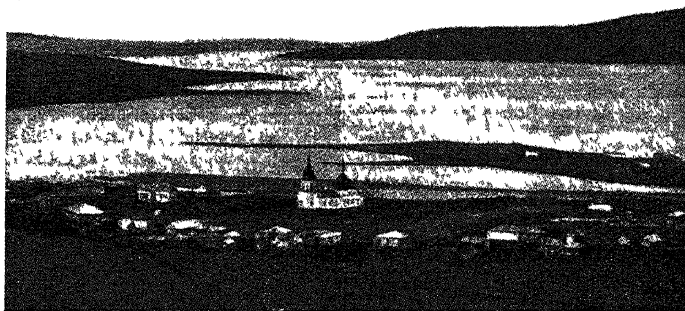
Kol. Primitive tribe on the S. watershed of the central Ganges plain, N. India, numbering about 300,000. The name was used generically for the Ho, Larka Kol, and Munda tribes; it was altered to Kolarian in 1866. Both terms have been discarded in favour of Munda to designate the western subfamily of Austroasian languages.

Kola. Peninsula of N. Russia, between the White Sea and the Arctic Ocean. It is coterminous with the Murmansk region of R.S.F.S.R., and includes most of Russian Lapland. The N. shore is called the Murman, i.e. Norman coast. The country is dreary and inhospitable, and before the Soviet five-year plans was inhabited on the coast only. Power for a big hydro-electric scheme is derived from the river Niva. The peninsula came into the news with the Allied expedition to the Murman coast, 1918.

Kola. Capital of Russian Lapland, in the peninsula of the same name, Murmansk region, R.S.F.S.R.

Kola Nut. Alternative name for Goora Nut (*q.v.*), the fruit of a tropical African tree.

Kolar. Dist., subdivision, and town of Mysore state, India. About one-quarter is under cultivation, millet, rice, and grain being among the chief crops. Kolar Gold Fields provides almost the whole of the gold output of India. The persistent gold-quartz veins have been worked to a depth of 8,000 ft. These veins, probably of pre-Cambrian age, traverse crystalline schists. Pyrite, pyrrhotite, arsenopyrite, and tourmaline are accessory vein-minerals. The gold occurs in pitching ore-shoots in which the ore averages 5 ft. wide.



Kola. Town and gulf of Kola, the capital of Russian Lapland, and a station on the Murman railway

Its small population is chiefly engaged in fishing. A very old town, it was once fortified and used as a place of exile, but the tsar Paul I pulled down the fortifications. It is on the Murman rly.

Kolaba. Dist. of India, lying S. of Bombay. A district of hills and tidal creeks, it has valuable forests of teak and blackwood. Kolaba Island off the main city, Alibagh, was formerly a pirate shelter. Only 58 p.c. of the area can be tilled, and only 46 p.c. of cultivable land is actually under crops, chiefly rice and pulses. Nearly all the people are Hindus. Area, 2,212 sq. m. Pop. 668,922.

Kolair. Lake of India, in Madras state. It is situated almost midway between the Kistna or Krishna and Godavari deltas, the haunt of wild-fowl. It varies greatly in size. During the monsoon it may cover 100 sq. m.; in the hot weather it shrinks and exposes the ruins of ancient villages.

There are manufactures of silk and cotton goods, oil and sugar mills, and wood, iron, and other works. Sugar and cotton cloths are exported. Imports include machinery, salt, ropes, and paper. Kolar town, an ancient centre, is of little commercial importance. Area, dist., 3,157 sq. m.; subdivision, 283 sq. m. Pop., dist., 836,954; subdivision, 84,685; town, 19,006. Kolar Gold Fields ranks as a city, with an area of 14 sq. m. and a pop. of 138,859. It is served by the rly. from Bangalore to Madras.

Kolberg (Pol. Kolobrzeg) Seaport of Pomerania, under Polish rule since 1945. Standing



Kolberg, Pomerania. The castle and grounds of this town under Polish administration

at the mouth of the Persante river, a rly. junction, it was a trading centre for grain, coal, and timber, with engineering and pharmaceutical industries. Known as a salt emporium from about 1000, it gained urban rights in 1255, fell to Brandenburg in 1648, and was turned into a fortress. It withstood two Russian sieges in the Seven Years' War, but fell by hunger to a third, in 1761; it was successfully defended against Napoleon in 1807. The only old building is the huge brick Gothic cathedral of S. Mary (1280-1320). The modern spa with mineral sources had some 20,000 visitors a year before the Second Great War, when the pop. was 33,735.

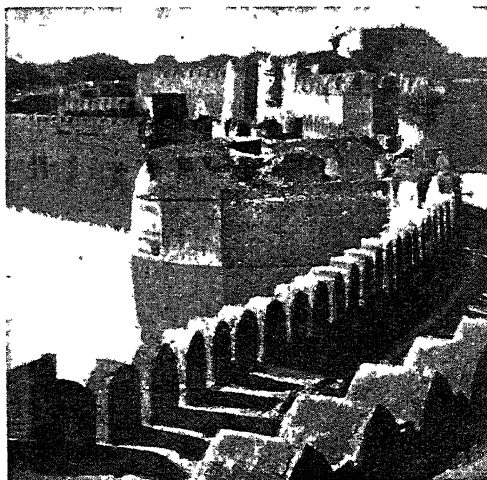
Kolding. Seaport town of Denmark, in Vejle co., Jutland. It stands on an inlet of the Little Belt, 14 m. by rly. S.W. of Fredericia, and 40 m. due E. of Esbjerg, also connected by rly. It has a good and spacious harbour, and a large export trade, including corn, hides, lard, provisions, and timber. An historic town, it contains the ruins of Koldinghus, a 13th century castle and one-time royal residence; also the oldest stone church in the country. A battle took place here in 1849, when the Danes were defeated by the Slesvig-Holstein insurgents. Pop. 27,660.

Kolguev. Island in the Arctic Ocean belonging to Russia. It is 75 m. N.E. of the peninsula of Kanin, in the region of Archangel, and is 45 m. long and 45 m. broad. Swampy and unhealthy, it is inhabited only in summer by fishing parties, and hunters of fur animals. There are large guano deposits.

Kolhapur. Town and former state of the Deccan, India, merged in 1949 in the state of Bombay. About two-thirds of the state is under cultivation, millet, rice, and sugar cane being among the chief crops. A 15-year development plan launched in 1946 was expected through irrigation to add greatly to the productiveness. The minerals include iron ore and stone. Cotton and woollen goods, pottery and hardware are manufactured. The exports include sugar, tobacco, and grain, and the imports piece goods and refined sugar. The ruler was a maharaja, entitled to a salute of 19 guns. Kolhapur city, state capital, is a trade centre and the terminus of a branch from the rly. between Poona and Belgaum. There are remains of a great temple dedicated to the goddess Mahalakshmi, three colleges, other teaching in-

stitutions, and two film studios. Area, 3,229 sq. m. Pop., state, 1,092,046; town, 112,000.

Kolhapur was the most important state in the former Kolhapur and Deccan states agency, which came into existence in 1933 when direct relations were established between the government of India and various Bombay states and estates formerly known as S. Maratha country states. The transfer of power in 1947 gave a temporary return of independence to Kolhapur, and the other states [Akalkot, Aundh, Bhore, Jamkhadi, Jath, Kurundwad (Senior), Kurundwad (Junior), Miraj



Kolhapur. The fort of Kolhapur city in the former state of that name, Bombay, India

(Senior), Miraj (Junior), Mudhol, Phaltan, Ramdurg, Sangli, Savanur, Savantwadi, and Wadi Estate] covered by the agency. Aundh, Bhore, Phaltan, Miraj (Senior), Miraj (Junior), Kurundwad (Senior), Ramdurg, and Sangli formed a United Deccan state, but all were ultimately merged in Bombay state.

Koli or **Kuli.** Indian caste of peasants and labourers. Numbering about three millions, they descend from the aboriginal folk, perhaps a W. outpost of the wild Munda-speaking Kol, who have long been under Aryan subjection, and form the bulk of the present agricultural population of Gujarat. Their name, in the form coolie, has passed into European use to denote any labourer. In the Central Provinces they perform the most menial services; in the Punjab they are a weaving caste. Nominally Hinduised, they preserve many primitive customs; some are wild hillmen to this day. See India.

Kolima or **KOLYMA.** River of Asiatic Russia. Rising in the Stanovoi Mts., Far Eastern Region, it flows N.E. into the Arctic Ocean, after 1,000 m., partly through Yakutsk, A.S.S.R. It is ice-bound for nine months of the year.

Kolin. A town of Czechoslovakia, in Bohemia. It stands on the Elbe, 35 m. by rly. E. of Prague. It is an industrial town, sugar being the principal manufacture. The 13th century church of S. Bartholomew, with a fine Gothic choir, is noteworthy.

Kolin, BATTLE OF. Action in the Seven Years' War in which Frederick the Great was defeated by the Austrians, June 18, 1757. The victory at Prague on April 5 had enabled Frederick to invest that town, but on hearing that Daun, at the head of 60,000 men, was marching to its relief, the Prussians advanced and gave battle at Kolin. Frederick's army of 34,000, after six hours' heavy fighting, was utterly defeated, with a loss of 12,000 men and 40 guns. The principal result of the battle was the raising of the siege of Prague.

Kolkhoz. A collective farm in the U.S.S.R. See Collective Farming.

Köllicher, RUDOLPH ALBERT VON (1817-1905). Swiss anatomist and embryologist. Born at Zürich, July 6, 1817, he became professor of physiology and comparative anatomy there in 1844. In 1847 he transferred to Würzburg, where he remained until his death, Nov. 2, 1905. His studies added vastly to the knowledge of the nervous system, muscles, etc. He wrote the first work on comparative embryology, and a text book on microscopical anatomy. Made an F.R.S. in 1860, he was awarded the Copley medal in 1897.

Kölnische Zeitung, DIE (Cologne Journal). German newspaper. It dated back to 1651, adopting its later name in 1798. It was the first paper in Germany to be printed on a mechanical press. Politically nationalist but liberal, it was suppressed by Hitler.

Kolobeng. A native town of Bechuanaland, S. Africa. Here Livingstone laboured in 1847 before

journeying to Lake Ngami. It then formed the capital of Sechele's country, but is now only a village.

Kolomea. Town of Poland, in Stanislawow co. It is situated on the Prut, 122 m. by rly S.E. of Lwow within the Galician oilfield. Its manufactures include pottery, petroleum, and candles. The junction of six rlys., it was of vital strategic importance in the First Great War, and was the scene of heavy fighting between the Russians and Austro-Germans, each side taking it twice. Pop. 33,385.

Kolomna. Town of R.S.F.S.R. It is in the region, and 60 m. S.E., of Moscow, and a station on the Moscow-Ryazan rly. The textile industry is considerable, and there are soap, leather, machinery, and tobacco factories. Trade is done in agricultural commodities, cattle, salt, timber, and coal. Pop. 75,139.

Kolozsvár. Hungarian name of the Rumanian place now known as Cluj (*q.v.*).

Koltchak, ALEXIS (1874-1920). Russian sailor. He entered the Russian navy in 1891, saw service in the Russo-Japanese War of 1904-05, and was among the officers who surrendered at Port Arthur. He was rear-admiral of the Black Sea Fleet when the First Great War broke out, and in 1916 was appointed vice-admiral. After the revolution in 1917, his fleet mutinied at Sevastopol and arrested him. On handing in his resignation, he was permitted to withdraw from his ship. He organized a force in Siberia to cooperate with Semenov against the Bolshevik troops. In 1918 he formed an anti-Bolshevik government, with headquarters at Omsk, collected a considerable army, and marched W. to the Urals to inflict several defeats on the Bolsheviks. Falling into their hands, he was shot at Irkutsk, Feb. 7, 1920.

Koltsov, ALEXIS VASILÉVITCH (1809-42). Russian poet, called the Robert Burns of Russia. He

was born at Voronezh, Oct. 26, 1809, the son of a small cattle-dealer. A friendly bookseller having lent him volumes of poetry, which he read while tending cattle



Alexis V. Koltsov,
Russian poet

on the steppes, Koltsov began to write. Finding a patron, he was introduced to Moscow literary circles, and his rustic poems were published in 1835. After visiting

St. Petersburg, he returned to his family, but found little sympathy with his work. He died of consumption, Nov. 12, 1842. Consult Russian Poets and Poems, N. Jarintzov, 1917.

Kolubara. River of Yugoslavia. It rises in the hills S. of Valievo, runs E., then N., and enters the Save at Obrenovatz. Its valley, the scene of fighting between the Austrians and Serbians in the First Great War, gave its name to a battle in 1914, also called the battle of Suvobor, or of the Ridges, which, lasting from Nov. 6 to Dec. 15, helped to free Serbian territory from invaders.

Komarno OR **KOMAROM.** Town of Czecho-Slovakia. On the Danube in Slovakia at the mouth of the Vág river, it was fortified by Matthias Corvinus (1443-90), and four times invested by the Turks. It has steamer connexions with Vienna and Budapest, and is 52 m. by rly. S.E. of Bratislava. The part of the town on the S. bank, which went to Hungary under the Vienna award of 1938 (cancelled by the peace treaty of 1947), was captured by the Russians under Malinovsky, March 28, 1945; that on the N. bank, March 30. Pop. 21,137.

Komarov, V. L. (b. 1871). A Russian botanist. Educated at Moscow university, he visited Central Asia as an experimental naturalist in 1892, and was a member of the Manchurian expedition, 1895. Other expeditions took him to Kamchatka in 1908, and the Gissar mts. in 1932. President of the Soviet Academy of Sciences from 1932, he resigned 1945. He edited *Flora of the U.S.S.R.* (20 vols., of which nine were issued by 1944). His *Doctrine on Species*, 1940, earned the Stalin prize.

Komati. River of S.E. Africa. Its headstreams join near Bonnefoi, Transvaal, and it runs through Swaziland and Mozambique to Delagoa Bay. Low grade auriferous rock is found in the upper valley in the Steynsdorp district.

Komati Poort. Frontier settlement in the Transvaal. It is on the rly. from Lourenço Marques to Johannesburg, with a branch to the N.E. Transvaal, and near the junction of the Komati and Crocodile rivers.

Komisarjevsky, THEODORE (b. 1882). A Russo-British theatrical producer. Born at Venice, May 23, 1882, he was educated at St. Petersburg (Leningrad) university, and from 1906 was designer and director at imperial and state theatres in that city and Moscow. He left Russia after the revolution

and settled in London, becoming a British subject in 1932. From his first show in England, Prince Igor, at Covent Garden, 1919, he



T. Komisarjevsky,
theatrical producer

became one of the most discussed producers. His methods were often stylised and expressionist, with acting subordinated to production, but in his best staging, e.g. plays of Shakespeare, Gogol, Chekhov, he encouraged imagination in the theatre. He designed the interiors of the Phoenix Theatre, London, and several Granada cinemas. He published *Myself and the Theatre*, 1929; *The Theatre and a Changing Civilization*, 1935.

Komi-Zyrian. An autonomous republic of the R.S.F.S.R. Situated in the Pechora basin, it extends into the Arctic and Urals in the E., and the Archangel region on the W. The principal town is Syktykka. In the N. of the republic reindeer breeding is an important industry. Timber and furs are the chief exports, leather goods, flour, and tar and pitch preparations being also among the products.

Kom Ombo. Village of Upper Egypt. It is on the right bank of the Nile, 26 m. down stream from Assuan. The hill of Ombo commanded the Nubian trade routes. Restored in 1893, its great temple, erected in the Ptolemaic Age, was embellished by Tiberius and later Roman emperors. In the bipartite sanctuary were worshipped the hawk-headed Harpôeris and the crocodile-headed Sebek, and cemeteries of mummified hawks and crocodiles, animals sacred to those deities, lie close by.

Komotau. A town of Czecho-Slovakia, in Bohemia, also known as Chomutov. It lies at the foot of the Erzgebirge, 10 m. N.N.W. of Saaz (Zatec), and is an old town with an arcaded market, a 16th century town hall and church. Its industries include milling, weaving, and brewing. The town was annexed to Germany as part of the so-called Sudetenland in 1938, under the Munich agreement. Pop. 30,806.

Komsomolsk. City of the Far Eastern region of U.S.S.R. About 160 m. N.E. of Khabarovsk, with which there is rly. connexion, it is a centre of heavy industries, receiving coal and iron ore from mines in the area, and iron and steel from the Kuzbass and the

Urals. Crude oil brought from Sakhalin is refined here. Komso-molsk takes its name from *Komso-mol*, abbreviated title of the Russian league of Communist youth founded by Lenin. Pop. 70,746. See Comsomol.

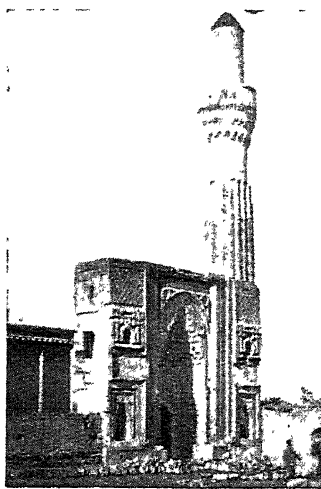
Konakry or **CONAKRY**. Port of the island of Tombo, and capital of French Guinea. By railway to Kurussa and Kankan it is in touch with the river Niger, and forms the commercial outlet for much of the trade from French West Africa. Here are branches of the European banks. Pop. 32,200.

Konev, **IVAN STEPANOVITCH** (b. 1897). A Russian soldier. Of peasant stock, he was in the Red Army from its formation. He led guerrillas in the Far East; fought against Koltchak's White Russians; and commanded an armoured train against the Japanese. He received further training at Frunze military academy. At the outbreak of war in 1941 he was Soviet commander in the west, subsequently forming the N.W. front army which led the Moscow counter-offensive. In 1942 Konev directed operations at Rzhev. Succeeding Gen. Zhukov in command of the 1st Ukrainian army in 1943, he led a lightning advance, taking Lwow and Brest-Litovsk and reaching the Vistula S. of Warsaw. In 1944 he was promoted Marshal. In Jan., 1945, Konev's forces broke from their bridgehead across the Vistula, crossed the Oder, and with Zhukov's forces took Berlin. Konev, who had received the Order of Suworov in 1943, became commander of Soviet forces occupying Austria. In 1946 he succeeded Zhukov as c.-in-c. In 1947 hereceived the Order of Lenin.

Kong. Mythical mountain range extending from Sierra Leone E. to Dahomé. Since 1888 this area has been recognized as a plateau with isolated mt. peaks, some of which exceed a mile in elevation.

Kong. Dist. of Africa. It is in the extreme N. of the French Ivory Coast. Kong consists of an elevated region forming the watershed between the Comoe, Bandama, and Bagoé rivers, with hills, forming part of the so-called Kong Mts., stretching W. into French Guinea. The highest point is the Pic des Kommono, 4,757 ft. The people are chiefly Bambaras.

Kong. Town in the dist. of the same name in the French colony of the Ivory Coast. It is situated in the N. of the colony on the main route to Bobo-Dioulasso. The surrounding country forms a plateau, alt. 2,000-2,500 ft.



Konieh. Mosque of Ala-ed-din in the capital of the vilayet of Konieh, Anatolia, Turkey

Kong-moon. A former treaty port, in Kwangtung prov., China, 70 m. S. of Canton. It was opened to foreign trade in 1904. Situated on the westernmost channel of the delta of the West river, it is the terminus of a local rly. to Sanking. Pop. 75,000.

Kongolo. Town of the Belgian Congo. On the Lualaba-Congo river, it is connected by rly. with Kindu, 250 m. N.N.W. Above Kongolo, the Congo is navigable as far as Bukama, on the rly. from Cape Town. Kongolo is the administrative capital of the dist. of Tanganyika.

Kongsberg. Town of Norway, in the fylke or co. of Buskerud. It stands on the Laagen river, 43 m. S.W. of Oslo. Mostly built of timber, it has an 18th century stone church and a town hall. The neighbouring silver mines, discovered in 1623, belong to the state. Their annual yield has been about 180,000 oz.

Kongwa. Settlement in Tanganyika. See Ground Nut Scheme in N.Y.

Konien or **KONYA**. A city of Anatolia, Turkey, the ancient Iconium. Capital of the vilayet of the same name, it lies about 300 m. E. of Izmir, with which and the Bosphorus it is connected by rly. The centre of a fertile district, it carries on a large trade, and its carpet and

silk industries are extensive and valuable. Between the city and Karaman, to the S.E., the arid country is being steadily improved under an irrigation scheme. Konieh has many fine mosques, and is famous for its monastery of the Dancing Dervishes. The extensive walls, now largely in ruins but retaining splendid gateways, were built during the period of the Seljuk sultanate in the 12th-13th centuries. One of the most distinctively Turkish towns, this was regarded as a possible capital failing the retention of Istanbul. Thousands of students crowd the houses of the city. In its neighbourhood the Egyptians, under Ibrahim Pasha, defeated the Turks in 1832. Pop. 58,834. The vilayet has a pop. of 667,268, most of whom are expert breeders of camels and horses. It includes much of the central steppe, is well forested, and grows poppies for opium.

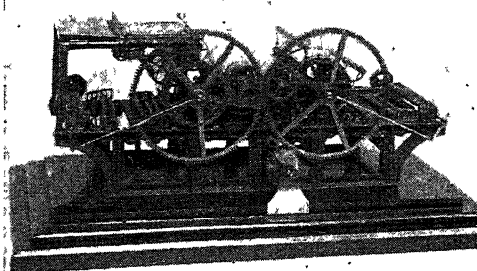
König, **FRIEDRICH** (1774-1833). Inventor of the first practical steam printing machine. Born at



Friedrich König, German inventor

Eisleben, Saxony, April 17, 1774, the son of a small farmer, he left Germany for England in 1806 with a project for a steamprinting press. It was possibly derived from a similar project patented in 1790 by Nicholson, but never carried into effect. König's first patent, taken out in 1810, was for a hand press so modified as to permit of power being applied to it. Refused by The Times, it was used to print sheet H of The Annual Register for 1810.

König, securing assistance from Bensley, a London printer, and Bauer, a German mechanic, experimented with the idea of the cylinder, and took out three other



König. Model of the first cylinder printing machine invented by Friedrich König Science Museum, S. Kensington

patents, in 1812, 1814, and 1816. Two machines were made for *The Times*, and on Nov. 29, 1814, this paper was first printed by steam, the rate of production being thus quadrupled to 1,000 single sheets per hour. Then König devised a method of printing on both sides of the paper as it passed through the machine. As improved by Applegarth and Cowper, this method was used to print *The Times* until 1827. König, in Germany in 1818, set up a factory for printing presses near Würzburg. Died Jan. 17, 1833. See *Printing*.

Königgratz. The German and historic name of the town in Czecho-Slovakia now known as Hradec Králové. It is 74 m. E. of Prague, at the confluence of the Elbe and Adler. The Gothic cathedral of the Holy Ghost, founded 1302, has a fine 15th century ciborium. The town hall con-

villages and heavy industrial settlements, and had in 1931 a pop. of 81,278, of whom 12,413 described themselves as German. Industries comprise cement, glass, and brick production, distilleries, and making agricultural implements.

Königsmarck, PHILIPP CHRISTOPH, COUNT (1662-94). Swedish soldier, born March 14, 1662. He



Count Königsmarck, Swedish soldier, and his sister Maria Aurora

became a close friend of Augustus II of Saxony, and was suspected of being the lover of Sophia Dorothea, wife of the crown prince of Hanover, later George I of England. It is believed that he was assassinated July 1, 1694.

His sister, Maria Aurora, was born (c. 1668) at Stade. After the mysterious death of her brother, she sought the aid of Augustus II and became his mistress and by him mother of Maurice, Marshal Saxe (*q.v.*).

Beautiful and intellectually brilliant, she was prominent in Berlin, Dresden, and Hamburg. She became prioress of the abbey of Quedlinburg, where she died Feb. 16, 1728.

Königs See. Lake of Germany, in S. Bavaria. It lies in the ex-

treme S.E. corner of Bavaria, S. of Berchtesgaden, in magnificent scenery, at a height of 1,975 ft., and is surrounded by mountains, which rise sheer from the water. Reputed the most beautiful lake in Germany, it is also called the lake of S. Bartholomew. It is 5 m. long and over 1 m. in width.

Königsstuhl. Spot of historic interest in Germany. It is near Rense on the left bank of the Rhine. In mediæval times the junction of four German electorates, it became the meeting place of electoral assemblies. In 1308 Henry of Luxembourg (Henry VII) was elected German king here, and later elections were held, and treaties made, on the same spot. In 1376 Charles IV erected a small octagonal building, to which the name of Königsstuhl was given. It was rebuilt in 1843, having fallen into ruins in the 18th century. See *Electors*; *Empire*, *Holy Roman*.

Königstein. The name of two small towns of Germany. One is in Saxony, on the left bank of the Elbe, among the rocks of "Saxon Switzerland." From the 13th century a strong fortress, it has held famous prisoners, including the French Gen. Giraud in the Second Great War. It has paper, wood, and engineering industries, and 3,795 inhabitants.

Another Königstein is in the Taunus hills near Frankfurt-on-Main, and has the impressive ruins of a 13th cent. castle, destroyed by the French in 1796. It is a health resort with mineral springs, sanatoria, kurhaus, and pop. of 3,003.

Königswinter. Town of Germany, in N. Rhine-Westphalia, on the right bank of the Rhine, 6 m. above Bonn. At the foot of the Siebengebirge (*q.v.*) or Seven Mountains, it is a health resort. The town is a starting-point for tourists to the Drachenfels (*q.v.*). Pop. 4,515.



Königgratz, Bohemia. Square with the cathedral, left, and the town hall. From a print published just after the time of the battle of Sadowa

tains a museum; there are many educational establishments, and a theatre. Musical instruments, machinery, soap, candles, gloves, and paint are made. The town suffered during the Hussite and Thirty Years' Wars. On the high ground to the N.W. was fought on July 3, 1866, the battle called after the adjacent village of Sadowa (*q.v.*), in which the Prussians defeated the Austrians. Pop. 52,292.

Königsberg. Capital of the former German prov. of East Prussia. Incorporated in the R.S.F.S.R. after the Second Great War, it was renamed Kaliningrad (*q.v.*).

Königshütte OR KRÓLEWSKA HUTA. Industrial town in Upper Silesia, ceded by Germany to Poland in 1922. Mines, ironworks, blast furnaces, rolling mills, etc., have existed since c. 1800. It lies between Beuthen and Katowice and arose from the merger of



Königswinter. View across the Rhine, showing (right), on the slope of the Drachenfels, the modern castle of Drachenburg, and at the summit the castle ruins celebrated by Byron

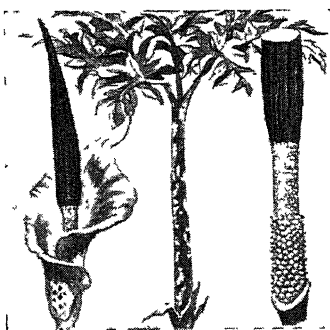
Koninck, PHILIPS DE (1619-88). Dutch painter. Born at Amsterdam, Nov. 5, 1619, he studied under Rembrandt, upon whose style he largely modelled his own. He was equally at home in landscape, figure, and portraiture, though evincing a decided preference for landscape. He is characteristically represented in the National Gallery, London, by a View in Holland and a View of the Schelde, with Antwerp Cathedral in the distance. He died in Amsterdam, Oct. 4, 1688.

Other members of the family attained some note as artists. Salomon de Koninck (1609-56), a native of Amsterdam, painted portraits, biblical scenes, and genre in the manner of Rembrandt, to whom many of his works have been attributed. He also made some good etchings.

David de Koninck (1636-c. 1699) was a native of Antwerp, studied there, and between 1670 and 1687 was in Rome, afterwards living in Flanders. Besides still life, he painted animals, especially rabbits, whence he is often known as Rammelaer. Many of his paintings, which resemble those of Jan Fyt, whose pupil he is said to have been, are at Amsterdam.

Konitz or CHOJNICE. Town of Poland, in Pomorze co., it lies 81 m. by rly. S.W. of Danzig, on the main line to Berlin. It is a rly. junction and a manufacturing town, the principal industries being ironfounding and spinning. Pop. 11,000.

Konjak (*Amorphophallus rivi-eri*). Perennial tuberous herb of the family Araceae, a native of



Konjak. Left to right, spathe and spadix, foliage, lower portion of spadix

Japan. The much divided leaves are about 4 ft. across, solitary, on a tall marbled leafstalk. The flowers appear before the leaves, and are clustered, like those of the cuckoo-pint, round a deep red spike which protrudes far above the rosy-green spathe. Konjak is largely culti-

vated by the Japanese, who obtain starchy food from the tubers.

Konkan. Name given to a tract of country in India. It lies below the Western Ghats S. of the Damanganga river and extending on the coast as far as Goa. The designation, of ancient origin, seems never to have signified a political division. Pirates infested the Konkan coast during the 17th and 18th centuries, and remains of their strongholds still exist. Owing to the heavy monsoon this narrow coastal plain has rich rice lands, which yield two or three crops annually, and coconut groves. Area, 3,907 sq. m. Pop. 3,750,000.

Konoye, FUMIMARO, PRINCE (1891-1945). Japanese politician. Konoye was born at Kyoto and



Prince Konoye, Japanese politician

educated at the imperial university of Tokyo. After sitting in the house of peers he was prime minister, 1937-1939, and then president of the privy council. He again became prime minister in 1940, and under his administration Japan exacted military concessions in Indo-China. He resigned in 1941. After Japan's unconditional surrender in 1945, Konoye was appointed vice-premier, but committed suicide by poison on Dec. 15, on learning of his imminent arrest as a suspected war criminal.

Koo (VI KUYUIN), WELLINGTON (b. 1888). A Chinese diplomatist. Born in Shanghai, he was educated in America, and became Chinese minister to Mexico, to Washington, 1915, and to Great Britain, 1921. He was a plenipotentiary at the peace conference of 1919, later head of the Chinese delegation; and was prime minister and foreign minister, 1926-27, and minister of foreign affairs, 1931. At Geneva and The Hague Dr. Koo was a prominent figure, being Chinese representative on the council of the League of Nations, and at the international court of arbitration from 1927. He also stood for China at the world economic and disarmament conferences.



Wellington Koo, Chinese diplomatist

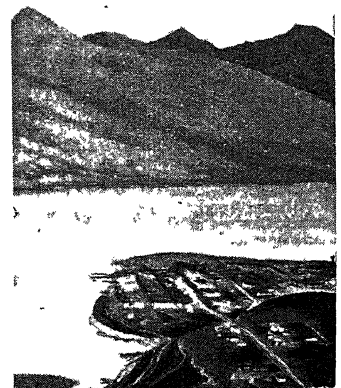
Minister to France in 1932, in 1936 he became ambassador. Later appointments were as ambassador to Great Britain, 1941-46, and then to the U.S.A. Dr. Koo was at Dumbarton Oaks, 1944, and the first meeting of the United Nations security council, 1946.

Kookaburra. Australian name for the Laughing Jackass (*q.v.*).

Koolan Island. Island off the N. coast of W. Australia, in Yampi Sound, long. 123½° E., lat. 16° S. It is worked for iron ore deposits.

Kootenay. A river of Canada. The chief tributary of the Columbia river, it rises on the W. of the Rocky Mts. in British Columbia, flows across adjacent parts of Montana and Idaho, emerges into British Columbia again W. of the Purcell range, flows into Kootenay Lake from the S., and leaves the lake to flow S.W. to the Columbia just below Lower Arrow Lake. Near Grohman in its upper course the Kootenay is separated from Lake Columbia by Canal Flat, 1 m. wide, across which the river is joined to the lake by a canal; the river flows S. and the lake empties into the Columbia river. At its farthest N. the Columbia is 300 m. from the farthest S. of the Kootenay. Area of basin, 16,000 sq. m.; length, 450 m.

Kootenay. Lake of Canada, in S.E. British Columbia. Long and narrow, it fills the valley between the Purcell and Selkirk ranges, receives the Duncan and Lardeau from the N. and the Kootenay from the S., and empties by the Kootenay river into the Columbia



Kootenay. The lake of S.E. British Columbia, with the rly. terminus of Kaslo in the foreground

river. Kootenay Landing, Proctor, Kaslo, and Lardeau on its shores are rly. terminals, and lake steamers make connecting links for the main Rocky mts. traffic lines.

Kootenay. Pass in the Rocky Mts. between British Columbia and Alberta. Sometimes called the Boundary Pass, it is the most southerly of the Canadian passes, in lat. 49° 9'. Between Castle Mt. and the Crow's Nest Pass, farther N., the North Kootenay Pass connects the valleys of the Flathead and Old Man's rivers.

Kopeck (Russ. *kopeyka*). Small Russian coin. It is the one-hundredth part of a rouble, one-tenth of a penny. See Rouble.

Köpenick OR CÖPENICK. Town of E. Germany, in Brandenburg. It lies on an island at the junction of the Spree and Dahme, 10 m. S.E. of Berlin, of which it became part in 1920. The chief buildings are the palace, now used as a college, and the town hall, a 17th century edifice. The manufactures include linoleum, chemicals, dye-stuffs, and shoddy. Köpenick was originally a Slavonic settlement, and was taken by the margrave of Brandenburg in 1240. The margraves had a castle here, which was replaced by the present palace. Pop. approx. 113,000.

The "captain of Köpenick" was an impostor, Wilhelm Voigt (d. 1918), a cobbler and former convict. On Oct. 16, 1906, dressed in the uniform of a captain of the guards, and accompanied by two grenadiers with fixed bayonets, he entered the office of the burgomaster of Köpenick, appropriated money, and sent the burgomaster and treasurer to the guard-house at Berlin in charge of the grenadiers. A week later he was arrested.

Koper. Town of Yugoslavia, called in Italian Capodistria (*q.v.*).

Kopje (Dutch, *kop*, top). Name given to flat-topped S. African hills produced by the denudation of an ancient plateau. They resemble Cornish tors and U.S. buttes. *Pron.* kop-py.

Kopparberg. Län, or county, of Sweden. It is an inland area drained by the Dal and its tribu-

taries, stretching from the highland frontier of Norway S.E. to the lowland of Vastmanland. Suljan and Runn are the largest of the numerous lakes. Forestry provides the main occupation. The capital is Falun. Area, 11,649 sq. m. Pop. 253,920.

Koprili OR KUPRULI. Name of a famous Turkish family, also spelled Kiuprili, and in other ways. Its greatness began with Mohammed Kuprili (c. 1590-1661), descendant of an Albanian who had made his home in Kupri, in Asia Minor, hence the family name. He obtained a post in the sultan's



Köpenick, Germany. General view of the town. On the right is seen the Rathaus

kitchen in Constantinople, but he was soon in a more influential position. Governor of Jerusalem, he rose rapidly in favour until in 1656 he was made grand vizier. He carried on a successful war with Venice, and took steps to keep back the Tartars. His rule was marked by great cruelties. He died Oct. 31, 1661.

Koprili's son, Ahmed (1635-76), succeeded as grand vizier. His short rule was a period of constant warfare against the Empire and the Poles. Other members of the family who held the post included Mustapha Koprili, made vizier in 1689, and killed in battle in 1691; and Hussein Koprili, grand vizier, 1697-1702. Abdullah Koprili, killed leading an army against the Persians in 1735, was the last notable member of the family.

Korah. Israelitish rebel and cousin of Moses. Objecting to the priesthood being confined to the line of Aaron, he raised a revolt against Moses. In this he is associated (Numb. 16) with Dathan and Abiram, but probably two revolts took place, one against the authority of Moses (Dathan and Abiram), the other against Moses and Aaron and the claim to the priesthood (Korah). The movement failed, and Korah and his household were burnt. His descendants later appeared as singers

in the temple, and certain of the Psalms (42-49, 84, 85, 87, 88) bear their superscription.

Koran, THE (Arabic *Qur'an*, that should be read). The Book, which was revealed to the Prophet Mahomet or Muhammad, both at Mecca and Medina, during the last 23 years of his life, and is believed by Muslims to be the word of God as distinguished from *Hadis*, i.e. the sayings of the Prophet. It is divided into 30 parts, each called a *Juzan* or *Para*, and subdivided into 114 chapters, each called a *Sura*, which has a separate title according to its subject. The first chapter or *Sura* is called *Alfatiha* (the Opening) and opens with the glorification of Allah, pointing out His chief attributes—"the Lord of the worlds, the Beneficent, the Merciful, the Master of the day of requital"—and concludes with a prayer for "the guidance to the right path"; therefore it is necessarily recited by Muslims in their daily five prayers.

The Koran was reduced to writing in the Prophet's lifetime under his personal care, and was also committed to memory by his companions—a practice still in vogue, so that hundreds of Muslims learn the sacred Book by heart and can recite the whole of it without a single mistake. The order of the Book is according to the subject-matter and not chronological, because, although some chapters were revealed in complete form, the revelation of many others was fragmentary, extending over a long period. It often happened that while one chapter was unfinished a new chapter was revealed. This order was effected by the Prophet himself, who, when any verses were revealed, called one of those who used to write the Koran, and said to him: "Write these verses where such and such verses occur."

In the reign of Caliph Abu-Bekr (*q.v.*), 573-634, the different bits of parchment, stone, palm-leaves, etc., on which the Koran was written, were reduced into one complete volume, from which more copies were prepared in the reign of Osman. The purity of its text is an established fact. It is in rhymed prose and is universally recognized as the finest production in Arabic literature. It claims to contain all the truths of previous revealed books, to be the final, unalterable, and the most complete law for humanity, and the last exposition of the natural religion of Islam, which according to it was the religion of Abraham,



Wilhelm Voigt, "The Captain of Köpenick"

Moses, Jesus, and all prophets of yore. Mahomet, to whom the Koran was revealed, is recognized by Muslims as the last prophet, *i.e.* the Divine Law-giver. See Islam; Mahomedanism; Mahomet.

Bibliography. English editions, ed. G. Sale, 1734; E. M. Wherry, 1881-86; J. M. Rodwell, 3rd ed. 1909; trs. E. H. Palmer (World's Classics), 1929; trs. R. Bell, 1939; The Holy Qur-ân, containing the Arabic Text with English translation and Commentary, Maulvi Muhammad Ali, 1917; The Speeches and Table Talk of the Prophet Mohammed, trans. S. Lane-Poole, 1882; Concordance, G. Flugel, 1842; New Researches into the Composition and Exegesis of the Koran, H. Hirschfeld, Eng. trans. 1902; Sources of the Qur-ân, W. St. C. Tisdale, 1905.

Korana or **KORAKUA**. Division of the Hottentot people in S. Africa. Aggressive and predatory cattle breeders, they live now chiefly in the middle and upper regions of the Orange, Vaal, and Modder rivers, but their former habitat embraced part of the Orange Free State and Stellaland. They are physically near to the Bushmen. See Hottentot.

Korce. Albanian name of a town described under its Greek form, Koritza.

Korčula. This Yugoslav island is described under its Italian name, Curzola.

Korda, Sir ALEXANDER (b. 1893). Hungarian-born British film director. Born of Jewish



Sir Alexander Korda,
British film director

stock at Turkeve, Sept. 16, 1893, he was educated at Budapest university and became a journalist. He was invited to direct films in the U.K. by the Paramount-British company in 1932. He founded London Film Productions, establishing a world reputation with *The Private Life of Henry VIII*, 1934. Later pictures included *Sanders of the River*, *Rembrandt*, *The Drum*, *Lady Hamilton* (1941). In 1939 Korda founded the company which bears his name to make pictures in Hollywood; this was affiliated in 1943 with Metro-Goldwyn-Meyer. Later films included *An Ideal Husband*, 1947; *Mine Own Executioner*, 1948; *The Elusive Pimpernel*, 1950. Korda was knighted in 1942.

Kordofan. Prov. of the Anglo-Egyptian Sudan. Bounded W. by

Darfur, S. by Equatoria, E. by Blue Nile and Upper Nile, N. by Northern prov., its length is approximately 400 m. N. to S., and its breadth 350 m. E. to W. The N. region consists of vast plains, broken by hilly tracts, which extend into the S. zone, where are the mts. of Dar Nuba. The country is crossed by numerous waterways, but it is doubtful whether any of the rainfall reaches the Nile, except that of the district drained by the Bahr-el-Ghazal and its tributaries, the Bahr-el-Homr and the Bahr-el-Arab. Kordofan is mainly a pas-

toral and agricultural country. Its forests yield gum, while iron exist. Exports are gum, dura, cattle, ivory, and ostrich feathers. There is a rly. from El Obeid to Kassala and Khartum. Area, 114,000 sq. m. The pop. consists of Arabs, hill communities known as the Nuba, the Shilluk, who inhabit the S. districts, and the Dinka in the S.W.

Kordofan was conquered by the Egyptians under Mehemet Ali in 1821 and was administered (1874-83) by the Sudan government. In 1883 the Mahdi besieged the capital El Obeid, which surrendered on Jan. 17, 1884. Administration was resumed in 1889.

Korea or **CHOSEN**. Peninsula extending S. from the E. coast of Asia, formerly a part of the Japanese empire. Its length is about 600 m., width 135 m., and area 85,246 sq. m. Along its S. and W. coasts are about 200 islands, these including Saishuto (Quelpart) and the Kyobunto or Nankaito group, the latter enclosing a magnificent harbour known as Port Hamilton.

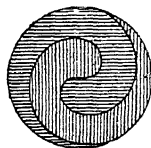
Korea is bounded N. by Manchuria and a strip of the Far Eastern region, U.S.S.R. In the



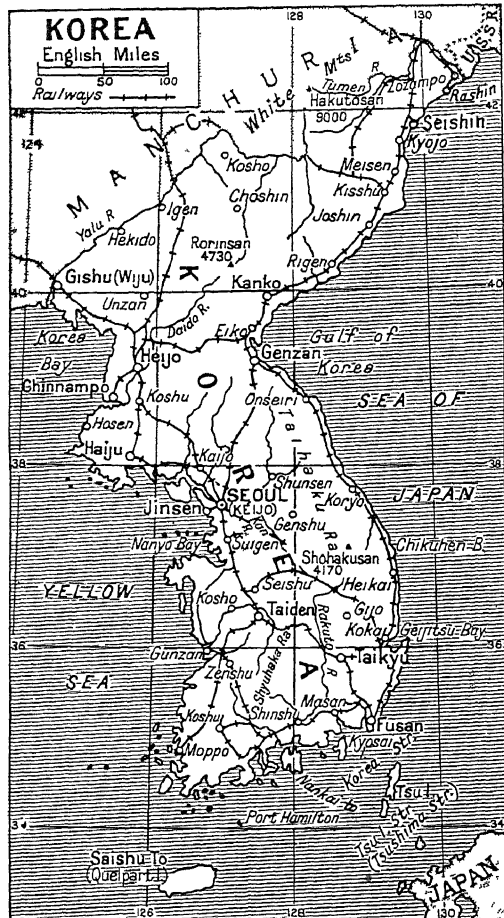
Korea. A ravine in the Diamond Mts., a range running from the White Mts. in the south of Korea.

N. are the Yalu and Tumen rivers, and the mt. range Fukanzan (Hakutosan) or White Mts. On its E. and W. coasts Korea is washed by the Sea of Japan, the Korea Strait, and the Yellow Sea. From the White Mts. in the N., a range, which includes the Diamond Mts., runs continuously to the S., nearer the E. than the W. coast, throwing off many lateral ranges so that the whole country is broken by hills and valleys and there are few extensive plains. The numerous rivers are rapid and shallow, and, besides those already named, the only ones used for transport for even short distances are the Kan, the Daido, and the Rakuto. On the Kan lies the capital Seoul (Keijo), with a pop. of 935,464; and on the Daido is Heijo (Ping-Yang), the old capital, with a pop. of 285,965. Other important towns are Gishu, Chinnampo, Fusan, Jinsen (Chemulpo).

The people are of the Mongol family, speaking a polysyllabic and agglutinative language of the Turanian group. They are physically a fine race, taller than the Japanese, and courteous in demeanour, though long misgovernment has made them indolent, apathetic, servile, with scant industrial or political capacity. Three-quarters of the area is forest. Gold, iron, and coal occur, but the chief industry is agriculture. Rice,



Korea. National
emblem



Korea. Map of the peninsula annexed by Japan in 1910 and liberated in 1945

millet, barley, beans, cotton, tobacco, and the Chinese medicinal plant ginseng are all cultivated. Cattle raising is extensive; hides are largely exported. Silkworms are reared. Manufactures were few and crude until the Japanese developed industries in fertilisers and chemicals, spinning and weaving. Pop. 22,800,000.

At the dawn of Christendom the people of Korea already possessed a high degree of civilization and literary and religious culture, and showed themselves brave and capable soldiers and seamen. The kingdom, founded by Kǐ Tsze in 1122 B.C., was unified under the name Korai in the 10th century by the founder of the Wang dynasty. This dynasty was overthrown in 1392 and replaced by that of Nǐ Taijo, which held the throne until 1910, when the last of the line was dethroned and the kingdom annexed by the Japanese, who gave it the name of Chosen.

1919 and to call forth a movement in favour of independence.

At the Cairo conference of 1943 the Allies decided that after Korea had been freed from Japanese rule the country would be given independence in due course. On July 6, 1945, U.S. bombers attacked targets over a wide area, and on Aug. 12 the Japanese naval base of Rashin and the port of Yuki were captured by Russians. Americans landed at Jinsen on Sept. 8, and the Japanese formally surrendered next day. It was announced that all Japanese officials would be replaced by Koreans. In 1946 Korea was divided at the 38th parallel into American and Russian zones of occupation. For subsequent events, see N.V.

Bibliography. Korea of the Japanese, H. B. Drake, 1930; In Korean Wilds and Villages, S. Bergman, 1938; Modern Korea, A. J. Grajdanzev, 1944; Old Korea, the Land of Morning Calm, E. K. Robertson Scott, 1946.

At the end of the 16th cent. Korea was invaded by the armies of Hideyoshi, the Napoleon of Japan. The Japanese ultimately withdrew, leaving behind universal desolation and ruin. Korea never recovered from this blow, and the misgovernment of its own ruling classes steadily brought about its downfall. For over 200 years it remained isolated from the world.

By treaty of Aug. 22, 1910, Korea was annexed under the name of Chosen to Japan. It was administered as colonial territory for 35 years. Shintoism was made the state religion, while study of Chinese classics and Confucian doctrine waned. But Japanese rule was severe enough to provoke revolt in

Korea. Strait or arm of the sea between S. Korea and Japan. It consists of Chosen and Tsushima Channels, separated by the island of Tsushima, and forms the principal inlet to the Sea of Japan. The distance from Fusan (Korea) to Shimonoseki (Honshu) is 144 m.

Korea. Former state of India, now merged in Madhya union. It lies on an elevated plateau of coarse sandstone culminating in the W. in the Korea Hills, of which the highest point is Deogarh, 3,370 ft. Rice and grain are among the exports, the imports including piece goods, sugar, and salt. There are iron deposits and extensive forests. The ruler was a raja. Area, 1,647 sq. m. Pop. 126,874.

Korea Bay. Northern extension of the Yellow Sea. It lies between Korea on the E. and Manchuria on the W. and communicates with the Gulfs of Chihli and Liaotung. In the strait off Port Arthur Russian naval forces were destroyed by Japanese, May, 1905.

Koregaon. Subdivision in India, in Satara dist., Bombay. It is crossed by the rly. from Poona to Belgaum. Its area is 345 sq. m. Pop. 91,776.

Koritza or **KORCE.** Town of Albania. Situated on a small stream flowing into Lake Mallik, it lies near the frontiers of Greece and Yugoslavia, about 55 m. S.W. of Monastir (Bitolj). During the First Great War its people, with those of the surrounding country, formed themselves under French auspices into a republic, which the French of the Salonica army held from 1916 until in 1919 it was handed over to Greece, together with the rest of Greek Epirus. An Italian base at the beginning of the Italo-Greek war in 1940, Koritza was captured by the Greeks on Nov. 22. After the German invasion in 1941, the Greeks withdrew. The German evacuation of Albania freed Koritza late in 1944. Pop. 22,787.

Körmendi, FERENC (b. 1900). Hungarian writer, born at Budapest. A bank clerk, he gained fame, after publishing novels in his own country, by winning in 1932 an international competition with a huge novel, *Escape to Life*, which was widely translated. He later settled in London.

Körmöczbánya. This is the Hungarian name of the town in Slovakia now known as Kremnica.

Körner, KARL THEODOR (1791-1813). German poet, born at Dresden, Sept. 23, 1791. In 1811 he went to Vienna, where he wrote several excellent plays for the

Hofburg Theatre. It is, however, as lyric poet that he is best remembered. In 1813 he joined the



Theodor Körner

army when Prussia rose against Napoleon. His service was brief though brilliant, both for the valour he displayed and for his outpouring of patriotic songs.

Only a few hours before his death he wrote his famous *Das Schwertlied* (Song of the Sword). He fell in action, on the high road from Gadebusch to Schwerin, Aug. 26, 1813, and a monument was erected near the spot. His songs were collected under the title of *Leier und Schwert* (Lyre and Sword), 1814; Eng. trans. W. B. Chorley, 1834. His biography was written by his father, Eng. trans. 1845.

Korniloff, LAVER GEORGEVITCH (1870–1918). Russian soldier. The son of a Cossack officer, he was born in Siberia, July 18, 1870, and in 1886 began military training. Later he was educated at the Nikolaiefsky military academy, and joined the regular army.



*L. G. Korniloff,
Russian soldier*

He served as a volunteer with the Boers in South Africa, and took part in the Russo-Japanese War, 1904–05. Early in the First Great War he was captured by the Austrians, but escaped into Rumania. During the retreat from the Dunajetz, Korniloff with the 48th division broke through the Austro-German encirclement, and rejoined the main Russian forces.

In the first days of the 1917 revolution he was given the Petrograd command, but resigned owing to interference with his orders. He then led the Russian 8th army, capturing Halicz from the Austrians. He replaced Brusiloff as generalissimo, but Kerensky charged him with conspiracy and removed Korniloff from his position in Sept. On the overthrow of Kerensky he joined the Kuban Cossacks attacking the Bolsheviks, and was killed in Caucasasia, March 31, 1918. See Kerensky; Russia.

Korolenko, VLADIMIR GALAKTIONOVITCH (1853–1921). Russian novelist. Born at Zitomir, July

15, 1853, he was educated there and at St. Petersburg (Leningrad) and Moscow. Having come into conflict with the authorities, he suffered banishment and imprisonment. In 1885 he settled at Nijni-Novgorod, returned to St. Petersburg about 1895, and later settled at Poltava. In 1885 his *Makar's Dream*, Eng. trans. 1891, established his reputation, afterwards enhanced by vivid poetic stories that were acclaimed as equal to Turgenev's. His other works include *The Blind Musician*, 1890; *In Two Moods*, 1892; *The History of a Contemporary of Mine*, 1910; *Tales of a Siberian Tourist*. He died Dec. 25, 1921.

Korone or **KALAMATA**, GULF or. Indentation of the coast of the Morea, Greece. See Kalamata.

Korosko. Village of Egypt, on the right bank of the Nile. It is 98 m. N.E. of Wady Halfa, and was the point whence caravans formerly started across the Nubian desert to Abu Hammed.

Korsör. Seaport and town of Denmark. On the W. coast of Zealand, it is 69 m. by rly. S.W. of Copenhagen. With a good harbour, it has a trade in coal, corn, fish, etc., and from here a train ferry goes across the Great Belt to Funen (Fyen). Korsör was a corporate town before 1400, and had a castle of which ruins remain. Pop. 9,728.

Koryak. Tribe of palaeasiatic stock in E. Siberia. They are settled fishers, or nomad reindeer herders, and inhabit the region between the Chukchi and the Kamchadals. Women and children are treated affectionately; the aged and infirm are commonly killed to save them from prolonged suffering. Their copious animistic mythology has Eskimo and Amerind parallels. The name means reindeer hunters. Koryak-Nymylak is the official name of a people in the Far Eastern Region of R.S.F.S.R., their capital being Penzhinskaya Kultbaza.

Kosciusko. Mt. in New South Wales. The highest peak in Australia (7,328 ft.), it is the culminating point of the Muniang range, a group of the Australian Alps. This region is the coldest portion



Kosciusko, New South Wales. One of the mountain tarns within the forest area. The hotel on the left is a great tourist centre

of Australia, and snow-drifts are met with even in summer. There are numerous evidences of former glaciation, notably the lakes and tarns, e.g. Lake May. The tree line is at 5,500 ft.; above this are bogs and summer pastures.

Kosciusko, TADEUSZ ANDRZEJ BONAWENTURA (1746–1817). Polish patriot. Born in Lithuania, Feb. 12, 1746, the son of a court official, he entered the Polish army. In 1777 he went to America to fight for the colonists against the British, returning to Poland in 1780. In 1792 he distinguished himself in the war with Russia by holding out for five days at Dubienka, with 4,000 men against 18,000. In the Polish rising of 1794, after the second partition of the country, Kosciuskowas made dictator, and the peasant army defeated the Russians at Raclawice. As a result of this success, Warsaw was soon in his hands, but the Russians were reinforced by the Prussians, and the Poles suffered disastrous defeat on Oct. 10 at Maciejowice, Kosciusko himself being taken prisoner. In 1796 he was released by the emperor Paul, and visited England, America, and France in turn. He finally settled at Solothurn, Switzerland, where he was killed through his horse falling over a precipice, Oct. 15, 1817. *Pron.* Koshosko. *Consult* Kosciusko, M. M. Gardner, 1942.



*T. Kosciusko,
Polish patriot*

Kösen. Spa of Thuringia, E. Germany, in the Saale valley. Formerly in Saxony, it is 4 m. by rly. W.S.W. of Naumberg, and is chiefly known for salt baths and springs. It produced wood and wine. Pop. 3,525.

Kosher (Hebrew, fit). Jewish term for what is ceremonially clean. The word is applied both to food and to the vessels in which it is prepared. Kosher meat, in which reference the term is usually employed, is that of a beast slaughtered by a licensed butcher according to the Mosaic law. The windpipe being cut by a clean stroke, the animal is bled to death, examined for any signs of disease, and soaked and salted before being fit for food. Kosher wine is made from grapes grown in Palestine, and prepared solely by persons of the Jewish faith. See Jews.

Kosi. River of India. Rising in the Nepal Himalayas, it enters Bihar in Bhagalpur dist., finally joining the Ganges in Purnea dist., 84 m. from the Nepal frontier. Its catchment area exceeds 20,000 sq. m., mainly in the Kinchinjunga dist.; it is subject to sudden floods and shifts its bed easily; the great load of silt which it carries rapidly covers the inundated areas, where, owing to its micaceous character, the silt destroys the fertility of the soil.

Kosice. A town of Czechoslovakia. Formerly a royal free city of Hungary, constituted so in 1270, it is the most important town in E. Slovakia, and is strategically important in connexion with routes across the Eastern Beskids from Hungary to Poland. It is situated on the river Hernád, 130 m. N.E. of Budapest. The cathedral of S. Elizabeth, the theatre, and museum are notable buildings. Most of the pop. are R.C. Magyars, but there was until 1938 a considerable Jewish colony. That year Kosice passed to the Hungarians, by whom it is called Kassa. Captured by the 4th Ukrainian army, Jan. 20, 1945, it was made the provisional capital of Czechoslovakia until the liberation of Prague.

Köslin (Pol. Koszalin). Town of Pomerania, under Polish administration from 1945. It lies 25 m. E. of Kolberg, and 7 m. from the Baltic coast. Its finest church is the 14th cent. Gothic Marienkirche. The industries of Köslin, which suffered much during the wars of the 17th and 18th centuries, have included iron-

founding, paper making, and brick making. Pop. 30,389.

Koslov. Alternative name of the Crimean seaport better known as Eupatoria (*q.v.*).

Kosseir, KUSSEIR, QUSEIR, OR KUSAYYAR. Seaport of Egypt, on the Red Sea. It is the terminus of a caravan route from Qena, on the Nile, over which a trade in corn is carried on with Arabia. A very ancient route, it was of great importance during the Middle Ages.

Kosovo or KOSOVOPOLYE. Plain of Yugoslavia, in Serbia, also known as Amsselfeld, or the field of blackbirds. It stretches S.W. from the river Ibar, and is bounded W. by the Albanian Mts., E. by the Sitnitze, a S. tributary of the Ibar, and S. by the Shar Dag. During Turkish rule there was a vilayet of Kosovo, more extensive than the plain, particularly towards the N. where it went up to the S. limit of the sanjak of Novi Bazar, and towards the E., where it included Uskub. The plain, about 50 m. long and 15 m. wide at broadest, is fertile and produces grain, tobacco, and fruit. It is of melancholy interest in Serbian history, for here in 1389 Murad I defeated Lazar, the last sovereign of the old Serbian

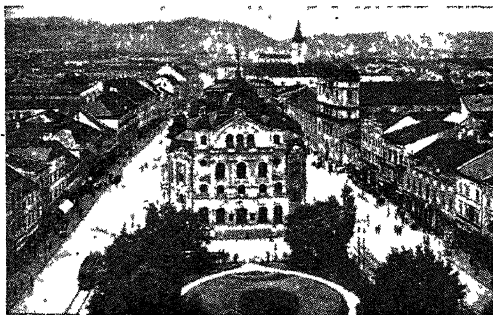
Allies transferred them to Corfu early in 1916. The organization of the Scottish Women's Hospitals under Dr. Elsie Inglis rendered heroic service during the retreat. See Serbia, Conquest of.

Kosovo-Metahija. Autonomous prov. of Yugoslavia, created July 9, 1945. It lies within Serbia, between the mts. of Kopanik, Skepska, Montenegro (Crna Gora), Sara, Prokletija, and Mokra Gora. Most of the people are Siptars; the chief occupation is agriculture. Among the towns are Pristina, Jakova, and Prizren. Pop. (1948) 727,176.

Kossuth, FERENCZ LAJOS AXOS (1841-1914). A Hungarian statesman. Born Nov. 16, 1841, son of Lajos Kossuth, he studied engineering in Paris and London, and worked as a rly. engineer in Italy. He returned to Hungary in 1895 and engaged in nationalist politics, being elected to the chamber. He was prominent in opposition until 1905, notably by his obstructive tactics against the army bills in 1902, and became minister of commerce under Wekerle in 1906. He died at Budapest, May 25, 1914. Pron. Kosh-oot.

Kossuth, LAJOS OR LOUIS (1802-94). A Hungarian patriot. Born of good family at Monok, in the N.E., Sept. 19, 1802, Kossuth studied law at the university of Budapest and first sat in the national diet at Pressburg (now Bratislava) in 1825. His energy and enthusiasm for the national cause attracted attention, and his written accounts of the debates were well known to nationalist leaders throughout the country, but his defiance of the censorship led to imprisonment, 1837-40. On his release, Kossuth became editor of the daily Pesti Hirlap, a nationalist organ. In 1847, elected deputy for Pest, he fearlessly denounced Austrian domination.

The revolution of 1848 brought Kossuth to the front. Under the constitution drafted by the Hungarian diet, he became minister of finance, with Batthyány, Deák, and Szechenyi as his chief colleagues. The quick response to his appeal for a national army to resist the invading Serbs and Croats was only one sign of his popularity. He visited most towns of importance and by his fiery



Kosice, Czechoslovakia. The main street, with the theatre, seen from the roof of the cathedral

Empire, which perished with him. Here, too, in 1448 Janos Hunyadi of Hungary was defeated by Murad II. In the first Balkan War of 1912 the Serbians defeated the Turks in several engagements in this district.

During the First Great War, in Nov., 1915, the plain witnessed the last stand of the Serbian armies, hemmed in on all sides except to the W. by German and Bulgarian forces. Rearguard engagements fought at Mitrovitz and Prizren, after the Bulgarians had forced the Katshanik pass, enabled the bulk of the Serbian armies to retreat into the Albanian Mts., and eventually after considerable hardships to Durazzo, whence the



Lajos Kossuth

enthusiasm raised a national *honved* of over 200,000 men. On Sept. 28 he became responsible for national defence, with Görgei (*q.v.*) as commander-in-chief. Practically dictator, he must be judged partly responsible for the disasters that followed. Ignorant of military matters, he could not get on with his generals. But he inspired the rank and file and fired them to the successes of April, 1849.

Then his famous declaration of independence sent a thrill of inspiration throughout Europe, but early in Aug., realizing that surrender to Austria was an eventual necessity, he abdicated in favour of Görgei, on whom the thankless task thus devolved. Had Kossuth remained in power he might have wrung better terms from Austria, but his vanity forbade such a personal humiliation, and on Aug. 21 he crossed the Turkish frontier for refuge.

He came to England through France, meeting with an enthusiastic welcome in both countries, 1851. From the U.S.A. he conducted a violent propaganda campaign against Austria. The rest of his life was spent in exile, during 1852-59 in England, then in Italy. He died at Turin March 20, 1894, having been deprived of his Hungarian nationality, but was buried publicly in Budapest on April 1. *See Hungary: History. Consult* *Memories of My Exile*, L. K., new ed. 1894; Kossuth, O. Zaneck, Eng. trans. 1937.

Koster. Settlement in the Transvaal, 27 m. S.W. of Rustenburg, and on the rly. to Johannesburg. Here in 1922 were discovered caves in which were mummy animals, implements, and red pictures on the walls, believed to be of great antiquity. H. S. Harger, the geologist, reported that the district revealed evidence of occupation by a race of considerable intelligence at a remote period.

Kostroma. The capital of the region of the same name in R.S.F.S.R. It stands on the left bank of the Volga, 200 m. N.E. of Moscow. Of its numerous ecclesiastical buildings, the Uspenski cathedral (1239, rebuilt 1773) is famous. The chief industries are tanning and the manufacture of woollen and linen goods, of agricultural machines, and of ironmongery. Here the first of the Romanovs, elected tsar of Russia, 1613, was brought up. Pop. 121,205.

Kosztolányi, Dezső (b. 1885). Hungarian poet and author, born March 29, 1885, at Maria-Theresiopel (Subotica). With Ady, Babits,

and Moricz he created a new literary realism in Hungary, after having produced delicate lyrical poetry, and edited the periodical *Nyugat* (The West). Short stories and novels, of which *The Skylark*, 1927, *The Bad Physician*, 1928, *Anna Edes*, 1929, etc., were translated into foreign languages, made him representative of modern Hungarian thought.

Kota. Primitive tribe in the Nilgiri hills, S. India. In appearance they are a copper-hued, very long-headed people of medium height, occupying seven villages, and inhabitants of the same street may not intermarry. Non-caste Hindus, speaking a Dravidian dialect, they are artisans, or menials of the Todas. *See* India.

Kota Bharu. Capital and seaport of Kelantan, Malaya. On Dec. 7, 1941, the Japanese opened their attack on Malaya and Singapore by landing near Kota Bharu. They caused British and Indian troops to withdraw to a new line S. of the town on Dec. 10. Pop. 14,843.

Kotah. Town and former state of India, now part of Rajasthan. About one-fourth is under cultivation, millet and wheat being among the chief crops. The minerals include iron and stone. Among the exports are cereals, oilseeds, and hides; piece goods, rice, sugar, and metals are imported. The ruler was a maharao, entitled to a salute of 17 guns. The capital, Kotah, is an important rly. junction on the line from Ratlam to Muttra. The state had an area of 5,714 sq. m. Pop. of state, 777,398; town, 70,000.

Kotelnoi. Largest of the New Siberia Islands. Lying off the N. coast of Siberia, lat. 75° N., long. 140° E., it is a desolate island about 120 m. by 70 m., is mountainous, rising to 1,200 ft., and contains a lake and several rivers. It was formerly known as Kessel Island. Like the other Islands of the group, it is uninhabitable.

Köthen. Town of Saxony-Anhalt, E. Germany, 19 m. N. of Halle. It was occupied in 1945 by the U.S.S.R. It has a modern town hall, technical institute, library of some 20,000 volumes, and a splendid ornithological collection housed in a 16th century castle, formerly the residence of the dukes. The chief church is S. James, a Gothic building of c. 1400. The industries include boiler making and iron founding. Originally a Slav settlement, Köthen became a corporate town in the 12th century. From 1603 to 1847 it was

the capital of Anhalt-Köthen, a small state. Pop. 26,709.

Koti. Former small state of India. It was one of the Simla hill states of East Punjab, feudatory to Keonthal (now in the Himachal union). Only a fraction of the area is cultivated, chiefly for wheat and pulses. Its area is 50 sq. m. Pop. 9,721, nearly all Hindus.

Kotka (Finnish, *Ruotsinsalmi*). Seaport of Finland. It is in the dist. of Viborg (Viipuri), on a small island on the N. coast of the Gulf of Finland, 12 m. S.W. of Frederikshamn. There are a number of sawmills and from the three harbours trade is done in timber. Pop. 21,704.

Koto. National musical instrument of Japan. Derived from a Chinese prototype, the kin, the koto was adopted by the Japanese early in the 17th century. Somewhat resembling an elongated dulcimer, it consists of a slightly convex sounding board. The lower end rests on the ground while the other end is supported on two legs. Thirteen strings, passing over a low ridge at the upper end of the board, are stretched from end to end, and each string has its own movable bridge. The instrument is played by plucking the strings above the bridges with three ivory plectra worn on the thumb and first and second fingers of the right hand; the left hand being used to adjust the movable bridges or to press the strings to alter tone.

Kotonou. Kotonou, or Coronou. Port on the coast of Dahomé, French West Africa. Situated between Whydah and Porto Novo, it is on rlys. along the coast and to the interior. Here are the courts of justice and the customs house of the colony. It is the port of the capital, Porto Novo.

Kotor. Yugoslav town more familiar as Cattaro (*q.v.*).

Kotri. Town of Pakistan, in the Dadu dist. of Sind. Here the rly. from Karachi to Hyderabad crosses the Indus by a five-span bridge of 350 ft. (1900), which also carries a main road. The neighbourhood is barren, supporting a nomad people. Pop. 9,979.

Kottayam. Div. and town of India, in Travancore. The town contains old and interesting Syrian churches and is a road junction and trade centre of some importance. The area of the div. is 2,319 sq. m. Pop., div., 1,356,920; town, 18,000.

Kottbus. German town entered as Cottbus (*q.v.*).

Kotzebue, AUGUST FRIEDRICH FERDINAND VON (1761-1819). Ger-

man dramatist. Born May 3, 1761, at Weimar, he studied law, and held official appointments at St.



A. F. F. von
Kotzebue,
German dramatist

Petersburg (Leningrad) and Reval (Tallinn). The remarkable success of his play Menschenhass und Reue, long popular in England as *The Stranger*, 1790, decided him to write almost exclusively for the theatre. He produced upwards of 200 plays, but his influence is due more to his instinct for stage effect and originality of technique than to pronounced literary merit.

In 1800 he was arrested and sent to Siberia, one of his plays having offended the authorities, but was recalled by the tsar and made director of the St. Petersburg Theatre. From 1816 he lived in Germany as a Russian secret service agent, and on March 23, 1819, he was assassinated at Mannheim by Sand, a student, whose indignation had been aroused by Kotzebue's *History of the German Empire*, and by his ridicule of the Burschenschaft (*q.v.*).

Three sons of Kotzebue attained distinction in different ways. Otto, born at Reval, Dec. 30, 1787, commanded a Russian expedition in search of a N.E. passage, 1815-18, in the course of which the N. coast of Alaska was explored, Kotzebue Sound discovered, and much geological and botanical knowledge acquired. In 1823-26 Kotzebue visited the Philippines, Samoa, and Hawaii. He died Feb. 15, 1846. Wilhelm (1813-87) was Russian minister at Dresden, 1870-80, and wrote dramas under the pen-name Wilhelm Augustsohn, also a defence of his father, 1884. Alexander (1815-89) studied painting in St. Petersburg, and in Paris under Horace Vernet. He painted a series of historical pictures for the Winter Palace in St. Petersburg, illustrating Russian victories. *Pron.* Kotsebo.

Kotzebue Sound. Indentation of the N.W. coast of Alaska. It is crossed by the Arctic Circle, and lies to the N. of Seward peninsula and Bering Strait. It was discovered in 1816 by a Russian expedition (*v.s.*).

Koumiss. Fermented beverage made from mare's or camel's milk by Asiatic nomad peoples. In Europe and America koumiss is also prepared from cow's milk. The usual way of making it is to add a

small quantity of koumiss left over from a previous brewing, together with a little yeast, to the fresh milk. The process of fermentation takes between 30 and 40 hours. It has a curious acid taste and is valuable in medicine because of the vitamin B content of the yeast. *Pron.* koo'-miss.

Koussevitzky, SERGEI ALEXANDROVITCH (b. 1874). Russian-born American conductor. Educated at Moscow conservatoire, he founded and directed his own symphony orchestra, 1910-18, and after the Russian revolution conducted in Paris, London, and Berlin. During 1924-49 he was conductor of the Boston symphony orchestra, and in 1938 initiated the Berkshire music centre, U.S.A. His compositions include pieces for double bass, on which he was an expert performer.

Kovalevsky, ALEXANDER (1840-91). Russian embryologist. Born at Dvinsk (Daugavpils), Nov. 7, 1840, he studied at Heidelberg and became professor of zoology at St. Petersburg. He published a series of papers on embryological subjects which were unsurpassed and gave him a world-wide and lasting reputation. The most important were on the embryology and structure of a simple ascidian (1866 and 1871), of amphioxus (1867 and 1877), and worms and arthropods (1869). Kovalevsky was the first to show that a complete study of the embryology of animals was necessary for the understanding of their mutual relationships.

Kovalevsky, SOPHIE (1850-91). Russian mathematician. Born in Moscow, Jan. 15, 1850, she went to St. Petersburg in 1865, and was taught the calculus. Marrying in 1868, she went to Germany and studied mathematics at Heidelberg, attracting the attention of Königsberger and Kirchhoff by her brilliance. From 1870 she studied privately under Weierstrass, displaying remarkable abil-

ity. In 1884 she was appointed professor of mathematics at Stockholm, an appointment she held



S. Kovalevsky, Russian mathematician

until her death on Feb. 10, 1891. One of the greatest women mathematicians, Sophie Kovalevsky received a number of prizes for papers which she contributed to scientific periodicals, and was elected to the St. Petersburg academy of science. She was famed also as a novelist, the *Privatdocent*, 1877, and *Recollections of Childhood*, 1890, being popular. The death of her husband left her in a state of depression from which she never fully recovered. A study by A. Löffler appeared in 1892.

Kovda. River of Karelo-Finnish S.S.R. During a course of 45 m., it conveys to the gulf of Kandalaksha the waters of several lakes, including the Kovdozero (Kovda-lake), from which it issues.

Kovel. Town of Ukraine S.S.R. It is in Volhynia, on the Turia, a tributary of the Pripiet, and is an important rly. junction, 120 m. S.E. of Brest-Litovsk. Cattle breeding is the chief occupation of the district. Captured during the First Great War by the Austro-Germans, Sept. 3, 1915, Kovel was an objective in Brusiloff's 1916 campaign, but was not reached. Kovel was occupied by Russian troops in 1939, when Poland was divided between Russia and Germany. The Germans took the town in 1941 and remained until July 5, 1944.

Kovno. Russian name for a town of Lithuania S.S.R., called, in Lithuanian, Kaunas (*q.v.*).

Kovrov. A town of R.S.F.S.R. Situated in the Ivanovo industrial area, it is 75 m. N.E. of Vladimir on the Gorky-Moscow rly. and the

Klyazma river. It has rly. workshops, iron and copper foundries, textile mills, and trade in grain and bast. It expanded greatly under the five-year plans. Pop. 67,163.

Koweit OR KUWAIT. Seaport on the N.W. coast of the Persian Gulf. Situated 80 m. due S. of



Koweit. Waterfront of this seaport on the Arabian side of the Persian Gulf

Basra, it is the capital of the Arab state of the same name and was formerly the leading entrepôt of central Arabian trade. An attempt by the Turks to occupy Koweit in 1901 was frustrated by the British. The state is mostly desert, but its oil resources, which are among the largest in the Middle East, are exploited, crude petroleum being exported in vast quantities. It has an est. pop. of 100,000 and is ruled by an independent sheikh in friendly relations with Great Britain; his income from oil royalties exceeded £4,000,000 per annum in 1949-50.

Kowloon OR **KAULUNG**. Former city of China. It gives its name to the peninsula in which it is situated immediately opposite Hong Kong. Kowloon was outside the territory originally ceded to Britain in 1860, and when in 1887 it was found necessary to establish a customs cordon on the boundary to check smuggling, Kowloon frequently became the general name for all the stations. With the extension of the colony's boundaries in 1898 the customs stations were moved outside the limits of the leased territory, but kept the original name. The main industrial centre of the colony, also including a large residential suburb, Kowloon was attacked by Japanese aircraft on Dec. 8, 1941; and on the night of Dec. 11-12 the British garrison was removed to Hong Kong. The settlement was in Japanese occupation until 1945. Pop. 392,125. *See* **HONG KONG**.

Kowtow OR **KOTOW** (Chinese, knock-head). Chinese salutation



Kowtow. Postures of the Chinese salutation: upper, kneeling; lower, rising, the superior being on the right in both cases

expressing homage, respect, or worship, performed by kneeling and touching the ground with the forehead. The kowtow to the emperor consisted in kneeling thrice and knocking the forehead on the ground nine times. After Lord Amherst's refusal to kowtow in 1816, the word came to be used figuratively in English for any act of obsequiousness or undue servility.

Koyasan. Monastery of Japan. It is situated on a wide plateau known as Mt. Koyasan (2,853 ft.), S. of Osaka. The monastery, which dates from the 9th century, covers 24 sq. m., and contains 130 reli-



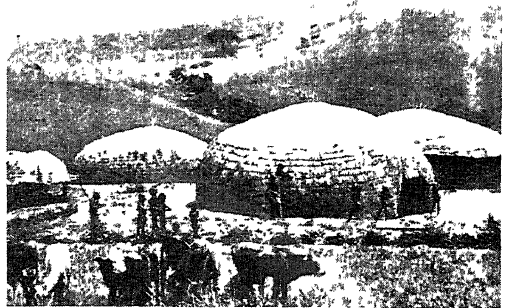
Kowloon, Hong Kong. The old city walls and the new town on the plain beneath the hill

gious buildings. The chief temple, Kongo-bu-ji, has a main hall measuring 180 ft. by 150 ft.

Kra, **ISTHMUS** OF. Narrow neck of land joining the Malay Peninsula to S.E. Asia. It is in Siam, S. of Tenasserim, Burma. In the invasion of Siam, Dec. 1941, Japanese troops made a landing here.

Kraal (Dutch). Group of huts built round a cattle enclosure, often stockaded with timber or mud. It is the typical Hottentot and Kaffir village; the word is also applied to E. African villages (*see* **ILLU.** above). It may denote the community itself, and, by extension, an encampment formed on the march, defended by palisading, wagons, and the like. *See* **HOUSE**. *Pron.* **krahl**.

Kraft-Ebbing, **RICHARD VON** (1840-1902). A German physician. Born at Mannheim, Aug. 14, 1840, he became one of the greatest of specialists in nervous diseases, holding professorships successively at Strasbourg, 1872; Graz, 1873; and Vienna, 1889. Equally known



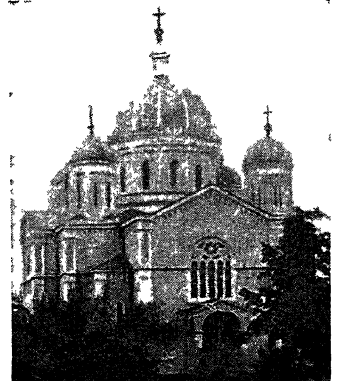
Kraal. Zulu kraal in Natal, example of an African native village. *See* entry in middle column

as teacher and practising specialist, he concerned himself chiefly with hypnotism and the pathology of sex. His *Psychopathia Sexualis*, 1886 (17th ed. 1924), was a work of outstanding importance, anticipating psycho-analytical methods later developed by Freud. Kraft-Ebbing died Dec. 22, 1902.

Krag, **THOMAS PETER** (1868-1913). A Norwegian author and poet, born at Kragerø, July 28, 1868. A leading figure in Norway's neo-romantic school towards the turn of the century, he wrote a dozen novels (mostly translated) and several plays. *Kobberslangen*, 1895; *Ada Wilde*, 1896; *Mester Magius*, 1909, are among his best-known works.

Vilhelm Krag, brother of Thomas, born at Kristiansand, Dec. 24, 1871, was next to Bjørnson one of the creators of modern Norwegian lyric poetry. Director of the Oslo national theatre, he was a fertile writer of comedies and fairy plays.

Kragujevatz. Town of Yugoslavia, which has several variant spellings of its name. It stands on a small W. tributary of the Morava, 60 m. S.S.E. of Belgrade, with

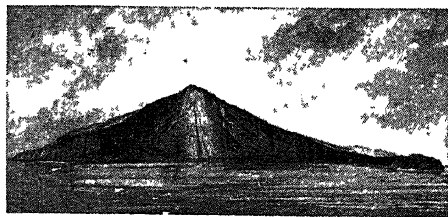


Kragujevatz. Cathedral in Byzantine style; the finest building of its kind in Yugoslavia

which there is rly. connexion. It contained the national arsenal of Serbia, and was a flourishing town until during the First Great War it was taken by the Austro-Germans, Oct. 23, 1915, and much damaged. It was recaptured by the Serbians Oct. 25, 1918. The Germans invaded Yugoslavia on April 6, 1941, during the Second Great War, and on April 11 captured Kragujevatz. It was liberated by Russian troops and Marshal Tito's forces on Oct. 21, 1944. Pop. 27,208.

Krakatoa. Indonesian island. It is situated in Sunda Strait almost equally distant from Sumatra and Java. During the second half of the 18th century a volcanic eruption had made a crater of which the vent had become plugged with solid lava. The crater occupied the N. part of the island, which then had an area of 18 sq. m.

In Aug., 1883, after preliminary rumblings and explosions, a tremendous eruption occurred during which the greater part of the island collapsed, forming a great caldera (*q.v.*). Upwards of 35,000 lives were lost, mainly in consequence of the great waves engendered. Dust from the eruption was carried throughout the atmosphere, and resulted in spectacular sunrises and sunsets all over the world. The sound of the explosion was heard in Australia, 2,000 m. away, and the air wave it caused circled the earth nearly four times before it died away. Fallen ash



Krakatoa. Cliff showing vent and structure of the original crater as exposed by the eruption of 1883

and pumice interfered with navigation in the neighbouring seas. Forty years later Krakatoa again seemed to have become active, sending up from the sea bed immense columns of lava to heights of 3,000 ft. An "island" which appeared in 1930 showed signs that seeds from plants had germinated, but within a few months a further eruption covered everything. Remnants of the original volcanic island can be traced in three separate islands which form the edge of the caldera.

Kraken. Fabulous sea-monster supposed to have been seen off the

Scandinavian coasts, where seamen at times mistook it for an island. The name, meaning tree trunk or stump, indicates the appearance of the floating monster. Tennyson has a poem called *The Kraken*.

Krakoviak (*Cracoviak*, *Cracovi-enne*). Polish dance, so called from the city of Cracow.

Kralievo OR **KRALJEVO**. Town of Yugoslavia, in Central Serbia. Situated on the Ibar, near its junction with the Western Morava, it is about 25 m. S.W. of Kragujevatz, and is connected by the Ushitze branch with the main Belgrade-Nish rly. A road leads almost due S. to Novi Bazar on a tributary of the Ibar. The centre of an agricultural district, Kralievo was a flourishing town of 10,000 people, but during the First Great War suffered severely. Occupied by the Austrians in Nov., 1915, it was regained by the Serbians in Oct., 1918.

Kralyevich, MARKO (14th century). Serbian national hero. Son of Vookashin, king of Macedonia, and a relative of the Serbian tsar, Stephen Dushan, he proclaimed himself king of the Serbians in 1371, but, not being acknowledged, had to content himself with a small territory around Prilip, in Macedonia, and that only as vassal of the sultan. At a battle that took place in Rumania, 1399, he was obliged to fight in the Turkish army, but said: I pray to God to grant the victory to the Christians, even if I have to pay for it with my own blood. The Christians won, but Marko died. He is the theme of many national songs.

Kramer, JOSEPH (*exec.* 1945). Commandant of the German concentration camp at Belsen (*q.v.*). When British forces took over the camp in April, 1945, conditions were such that those responsible were brought to trial at Lüneburg. Kramer, "the beast of Belsen," who had been on the staff of Oswiecim (Auschwitz) camp before transfer to Belsen, was found guilty of war crimes, and sentenced with ten others to death, Nov. 17, and hanged Dec. 14 at Hameln (Hamelin).

Krameria Radix. Dried root of rhatany (*q.v.*) used in medicine.

Kramskoi, IVAN (1837-87). Russian painter. After studying at the academy of St. Petersburg he produced several examples of genre and then took to portraiture. The Hermitage gallery at Leningrad and the Tretyakov museum at Moscow contain characteristic specimens of his work. He passed his life in poverty, and if his art



Kralievo. Main street of the Serbian town

was not of the highest class, his teaching was invaluable to those students who formed the pioneer group of Wanderers which did much to free Russian art from the incubus of the academic.

Krasinski, NAPOLEON ALEXANDER ZYGMUNT (1812-59). A Polish poet. Born in Paris, Feb. 19, 1812, he studied for a time at the university of Warsaw, but left Poland in 1828, most of his life being spent in Italy, Germany, Switzerland, and France. In 1834 he produced *Agay-Han*, a romance, and in 1835 the great poem *Nieboska Komedia*, translated into English as *The Undivine Comedy* in 1875. Other works of note were *Iridion*, *The Unfinished Poem*, and the *Psalm of the Future*. His intense patriotism was his main inspiration, but being the son of a general who favoured the Russian régime in Poland, he wrote anonymously. He died Feb. 23, 1859.

Krasnik. Town and subdivision of Poland. The former is 28 m. S.W. of Lublin, with which it is connected by rly. It is the most important town in this locality on the E. watershed of the San river. The scene of heavy fighting between the Russians and Austro-Germans in the First Great War, it gave its name to an indecisive battle fought July 1-9, 1915.

Krasnodar. Town of Soviet Russia, known under the tsars as Ekaterinodar. Situated in Caucasia, on the Kuban river, about 75 m. E.N.E. of Novorossiisk, it is the chief town of Adygeisk autonomous province. It has rly. connexion with Rostov and Novorossiisk, and has glass, chemical,

and tobacco factories. The town is the collecting centre for grain and fruit from the surrounding district, and is connected by oil pipe line through Maikop and Armavir to Makhach-Kala on the Caspian. The Russians evacuated Krasnodar on Aug. 19, 1942, during the German drive for the Caucasian oilfields, but recaptured it on Feb. 12, 1943. Pop. 203,946.

Krasnoe. Name of several villages in Russia. The best known is Krasnoe Selo, in the region and 15 m. S. of Leningrad, on the river Likovka and the rly. to Tallinn. There are earthenware and calico factories. Under the tsars Krasnoe Selo (red village) was an important garrison town.

Krasnovodsk. Town of Soviet Central Asia. The capital of a region of the same name in Turkmen S.S.R., it stands on a peninsula in the bay of the same name, opening into the E. of the Caspian Sea, almost due E. of Baku, with which it has steamer connexion. Krasnovodsk is the first station on the Trans-Caspian railway, which goes E. to Merv, Bokhara, and Samarkand, and the frontier of Afghanistan. The region, arid and infertile, produces sulphur and salt. There are unworked naphtha springs. There was long a lack of drinking water, but the waterworks of the town are now augmented by subterranean supplies.

Krasnoyarsk. A town of Siberia which gives its name to a territory of the R.S.F.S.R. It stands on the Yenisei and the Trans-Siberian rly. The centre of a gold mining district, it makes machinery, porcelain, and leather goods. There are a municipal museum and a rly. technical school. Founded by Cossacks in 1628, it was captured by the Japanese in September, 1918, in their campaign against Soviet Russia. Pop. 190,000.

Krassin, LEONID BORISOVITCH (1870-1926). Russian diplomatist. A Siberian, he was expelled from the technological college of St. Petersburg (Leningrad) for revolutionary activities. Arrested at Viborg in 1907 for plotting against the government, he was later pardoned. He was associated with Lenin and Trotsky in negotiating the treaty of Brest-Litovsk, 1918, and became army commissar of food. He was later the minister of commerce and industry. He visited London on trade missions in 1920 and 1921, and was chargé d'affaires there from Oct., 1925, until his death, Nov. 24, 1926.

Krause, KARL CHRISTIAN FRIEDRICH (1781-1832). German philosopher. Born at Eisenberg, May 6, 1781, he entered the university of Jena, then the chief seat of the German idealist philosophy, which he studied under Schelling and Fichte. He lectured at Jena, 1802-05, and lived at Dresden for the next eight years. There he came into conflict with the Freemasons through proposals for the reform of that body. He afterwards taught philosophy at Berlin, during 1823-30 at Gottingen, and at Munich from 1831 until his sudden death, Sept. 27, 1832.

His failure to obtain a professorship was partly due to his obscure style. His metaphysical system, panentheism, i.e. the doctrine that everything exists in God, is an attempt to reconcile pantheism and theism. The range of Krause's writings is very wide, including the philosophy of history, of law, and of religion. His work *The Ideal of Humanity*, 1812, was translated into English by W. Hastie in 1890. Froebel was his chief follower.

Kravchenko, VICTOR. For this Russian author of *I Chose Freedom*, see N.V.

Kravchinsky, SERGIUS MICHAELIVITCH (1852-95). Russian revolutionary best known by his pen-name of Stepniak (*q.v.*).

Krefeld or CREFELD. Town of Germany. It is near the Rhine, in the *Land* of N. Rhine-Westphalia, 32 m. N.W. of Cologne. Its prosperity is due to its position on the Westphalian coalfield, from which power is obtained for its important textile industries, prominent among which are the manufacture of silk and velvet. The town has also engineering shops, tanneries, chemical and soap works, and breweries. It is an important rly. centre.

Before the Second Great War the chief churches were the Friedenskirche and S. James, a modern Romanesque building. Krefeld's museum, opened in 1897, contained paintings, antiquities, and curios of various kinds; while its technical school, devoted to the study of the textile industries, is notable. Other buildings include that of the chamber of commerce.

Krefeld became a chartered town in the 14th century, and was soon a market of some importance. With the county of Mors, it passed into the possession of Prussia in 1702, and remained therein except for a few years during the time of the French Revolution. Its industrial prosperity began when reli-

gious refugees settled here, and was augmented by the introduction of the silk manufacture by Dutchmen and the opening of the Westphalian coalfield. Krefeld was a frequent target of Allied air attacks, suffering heavy damage before it was captured by troops of the U.S. 9th army on March 2, 1945. Pop. (1949) 153,600.

Kreisler, FRITZ (b. 1875). An Austro-American violinist. Son of a physician, he was born in Vienna, Feb. 2, 1875, and as a child displayed remarkable musical gifts. At 10 he won the gold medal for violin playing at the conservatoire, and at 14 made a tour of the U.S.A. He studied medicine, then painting, but returning to music made his Berlin début, 1899, and appeared in London, 1901. Claimed the greatest of contemporary violinists, he displayed a perfection of technique equalled only by his mastery of emotional tone. The first to perform Elgar's violin concerto (at a Philharmonic concert in London), he found his own compositions were popular in England and the U.S.A., e.g. *Caprice Viennoise*, *Tambourin Chinois*, *Polichinelle*, *Schön Rosmarin*. During the First Great War he served in the Austrian army, but he later lived permanently in the U.S.A. and was naturalised.

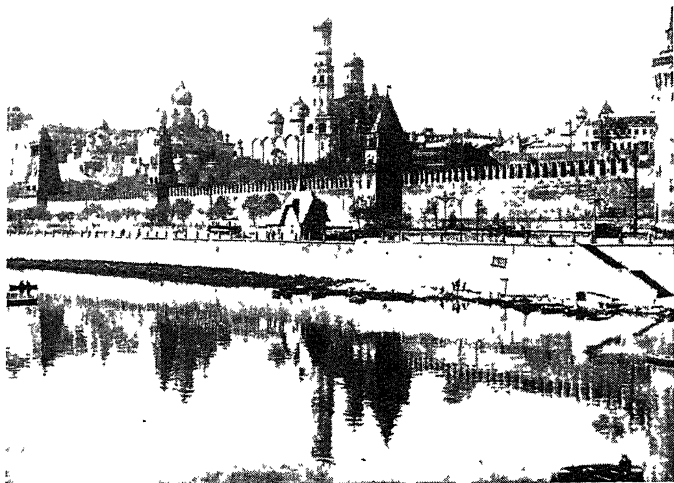


Fritz Kreisler,
Austro-American
violinist

Kremenchug. A town of Ukraine S.S.R. It is on the left bank of the Dnieper, in the region and 75 m. S.W. of Poltava, and on the main rly. from Kharkov to Odessa. Its manufactures include agricultural machinery and tobacco, while trading in timber, grain, and salt. Hydro-electric power has been much exploited. Evacuated by the Russians Sept. 14, 1941, in the Second Great War, it remained until Sept. 29, 1943, in German hands, seeing fierce fighting at the end. Pop. 89,553.

Kremlin (Russ. *Kreml*). Name of the citadel or acropolis of old Russian towns, the most famous being that of Moscow, to which the term is specially applied. This is triangular in shape, on a hill 125 ft. high, overlooking the left bank of the Moskva, and surrounded by a wall $1\frac{1}{2}$ m. long and 65 ft. high. It contains palaces, offices, and ecclesiastical buildings.

Among buildings are the Uspenski cathedral (1474), where



Kremlin. The Kremlin at Moscow, from the Moskoretzki Bridge; it includes palaces, old ecclesiastical buildings, government offices, and an arsenal

the tsars were crowned; the Arkhangelski (S. Michael), burying-place of the tsars down to the time of Peter the Great; and the Chudov monastery (monastery of wonders), remarkable for the bell-tower (320 ft. high) of Ivan the Great, at the base of which lies the broken bell, Tsar Kolokol. The palaces are mostly modern; the great palace, though not remarkable architecturally, is magnificently decorated within. There is also a large arsenal. When the Russian capital was transferred to Moscow after the 1917 revolution, government offices and residences of politicians were established within the Kremlin. Its name is now used symbolically to mean the Soviet government (*cf.* Downing Street, or the White House).

Kremnica. A town of Czechoslovakia, in Slovakia, 90 m. N.E. of Bratislava. At one time it was a German mining settlement, known as Kremnitz, in Hungary, and later was called Kőrnöczbánya. It is almost at the summit of the pass from the valley of the Turocz to that of the Hron (Gran), W. of the Tatra; both road and rly. use this route from Budapest to Silesia. The town was famous for silver mines in the Middle Ages. Formerly a royal free city, it has many ancient buildings. In the Second Great War it fell to Russian and Rumanian forces on April 3, 1945. The pop. is mixed Slovak, Magyar, and German.

Krems. A town of Lower Austria. It lies near the left bank of the Danube, 40 m. W.N.W. Krems is connected by the suburb of Undt to Stein, which serves as its river port; both are ancient

places. Steel goods, white lead, vinegar, and mustard are made. Pop. 27,917.

Krennerite. A mineral, gold ditelluride (AuTe_2), containing about 43 p.c. gold and up to 5 p.c. silver. It is a heavy silver-white material with a metallic lustre, occurring in short prismatic, orthorhombic crystals. It is a rather rare ore mineral of gold found in association with other tellurides (calaverite, sylvanite) at Cripple Creek, Col., Kalgoorlie, Australia; and elsewhere.

Kreuger, IVAR (1879-1932). A Swedish financier. Born at Kalmar, he trained as a civil



Ivar Kreuger, Swedish financier

engineer and went to New York, where he was a salesman and then worked on construction jobs. After some time in S. Africa, he returned to Sweden and in 1908 established his own firm of contractors. In 1913 he founded the United Swedish Match Company, which in 1917 became the Swedish Match Company and soon, with subsidiaries, virtually controlled the industry. It operated 250 match factories in 43 countries, in 16 of which it held state concessions. Germany was lent 15 millions in return for the grant of a virtual match monopoly; Hungary, Poland, Rumania received over 6 millions each. The company for years paid dividends of 15 p.c., but Kreuger got into difficulties during the economic

crisis. On March 12, 1932, he shot himself in his Paris flat.

The affairs of his companies were subjected to close investigations. It was discovered that 42 Italian treasury bonds amounting to £500,000 each had been forged by Kreuger and three of his fellow directors were put on trial. Kreuger's estate showed a deficit of £53 millions. The Swedish premier resigned upon the disclosure that he had received a cheque for £2,700 from Kreuger towards party funds; and the dead financier's brother Torsten was sentenced to 3½ years' hard labour for fraudulent bankruptcy. A report by Price Waterhouse, London auditors, stated that the company's falsifications had begun in 1917. Fraudulent manipulations had reached a height in 1923-24 with the fabrication of the Italian bonds. The winding-up of all the Kreuger companies in Europe and America took a number of years.

Kreutzer Sonata. Composition by Beethoven, op. 47, in A major. One of the most famous works for violin and piano, it was written in 1803 for Bridgetower, the violinist, and first performed in Vienna, May 17, 1803, Beethoven playing the piano part. A quarrel between violinist and composer caused the alteration of the dedication. This sonata is notable for its variations and the fine *andante*.

Kreutzer Sonata, THE. Story by Leo Tolstoy, 1889. It is a sordid presentation of the marriage of a young man, who has been something of a roué, with a sentimental young woman. They have nothing in common but the tie of matrimony, and in the end husband murders wife. Morbid and exaggerated, its plain speaking on the relations of the sexes raised a storm of criticism. In 1890 Tolstoy published a postscript to this work.

Kreuzer. Former German and Austrian coin. Originally this was the regional name for the grossus (*cf.* groschen) coined in Tirol c. 1270, which showed a cross (Ger. *kreuz*); then for 1/60th of a guilder, 1/90th of a thaler. Depreciated, it became a copper coin in the 18th century. Abolished in Germany in 1871, it continued in Austria until 1892 as 1/100th of a guilder, worth slightly less than a British farthing.

Kreuznach. Town and spa of W. Germany, in the Rhineland-Palatinate. On the river Nahe, it is 9 m. S. of the Rhine, on a main rly. to the Saar. The old and the new towns are linked by an old

bridge among others. The former was founded by the Romans on a Celtic settlement, had a Carolingian palace from 819, belonged to the bishops of Speyer (Spires) 1065-1437, then to the Palatinate, and from 1815 to Prussia. It was the seat of the imperial headquarters, 1916-18. Its saline springs, containing radium and iodine have for 200 years been famous; here and at the neighbouring spa, Münster-am-Stein, 20,000-30,000 patients yearly used to take this cure. There is trade in wine, a leather industry, and engineering production. Kreuznach was captured on March 18, 1945, by the U.S. 4th armoured division. Pop. 27,282.

Kreuz-Zeitung. Popular name of the Neue Preussische Zeitung, the daily paper which Prussian Conservatives founded in 1848 as a weapon against Liberalism. Edited by famous nationalists such as Prof. Schiemann and Baron Hammerstein, it frequently was in conflict with the government, in particular with Bismarck. It lost its importance during the Weimar republic, and was abolished by the Nazis in 1936.

Kriegsspiel (Ger. war game). Theoretical military exercise carried out without troops to instruct officers in the principles of strategy and tactics. Based on the Prussian Marshal Keith's war chess of the 18th century, Kriegsspiel was introduced in 1824 by Col. von Reisswitz, and was adopted by the armies of all nations.

To carry out the exercise two sides are formed, usually designated red and blue, and the materials required are three scale maps and several blocks of wood or metal to represent units of an army. Each side has one map, while the umpire has the third. The umpire's map shows the positions of both opposing forces, but each of the other maps reveals only the troops of one side and as many of the enemy as the umpire decides would be visible in warfare.

A general idea of the military position at the start of the supposed attack is supplied, followed by special details as to the disposition of troops and character of the country. Each player then frames his orders, to which he is held. In order to create unforeseen situations, such as would occur in actual warfare, the umpire gives one or the other side vague information of the kind a scout might afford, so causing an alteration in plans to overcome a temporary difficulty.

Each move by a player is limited to two minutes, and the counters representing troops can be moved only for such distances as would be traversed in that time. When artillery is firing on infantry, the losses of the latter are determined by a table of odds in conjunction with a throw of the dice. Repulsed troops cannot come again into action for five moves, or defeated troops for ten moves, while totally beaten troops are removed from the board. When a dispatch rider is supposed to be taking a message across country, dice decide if he arrives safely.

Kriegsspiel teaches officers to interpret the orders of a superior and to issue clear and comprehensive orders to subordinates in the face of unexpected situations. It inculcates correct map reading and appreciation of the influence of ground on tactics. A similar exercise, with the added complications of aerial and armoured warfare, is still practised.

Krilenko, AARON ABRAM (b. 1885). Russian soldier and revolutionary. Born at Bieloff, he was educated at Lublin, where he came into conflict with the authorities by speaking at a prohibited meeting of students. In 1905 he led a revolutionary band, his pseudonym in accordance with Russian revolutionary practice being Comrade Abram. Arrested in 1906, he was tried and acquitted, but then returned to Lublin, where he wrote *The Research of Orthodoxy*. He studied law and became a teacher of history and literature. In 1913 and 1915 he was again arrested. At the outbreak of the revolution he became president of the committee of the army and delegate to the first congress of Soviets. Imprisoned by Kerensky, in the Bolshevik coup he became commander-in-chief, resigning in March, 1918. Later he became private secretary to Lenin, with whom he quarrelled in 1921.

Krill. The planktonic food of whalebone whales or *Mystacocoeti*. The word is traditional in the whaling industry and originates from the Norwegian *kril*, young fish or fry. *Mystacocoeti*, a sub-order of Cetacea, which include most whales of economic importance, feed by passing water through banks of baleen or whalebone attached to their jaws and so straining off the small floating animals which are then swallowed. As the commonest animals taken are small crustaceans, swarms of these, *Euphausiaceae*, are referred to as krill. From early times.

whalers have differentiated types of krill of which the constituent animal has since been identified. Red krill, blue-whale krill, and fin-whale krill are swarms of *Euphausia superba*, the main diet of southern whales. Lobster krill is the larva of the squat-lobster. In the north, stor-krill and smaa-krill are formed by other euphausians. Whalers note the presence or absence of krill as a guide in their search.

Kris, CREASE, OR CREESE. A Malay weapon. It is a dagger or knife of varying size and shape,



Kris. Dagger-like weapon of Malay with a sinuous blade
Courtesy Malayan Information Agency

sometimes straight, long, and narrow, but frequently made with a wavy or sinuous blade. The hilt, generally of wood or ivory, and the scabbard are sometimes highly ornamented.

Krishna OR CRISHNA. God of the Hindus, sometimes regarded as an incarnation of Vishnu, and sometimes as Vishnu himself. His story is set forth in the Indian epic Mahabharata. A powerful chief though brought up among peasants, he is looked upon as peculiarly the god of the lower classes, and is represented as trampling upon the head of a snake, and playing a flute, while holding the tail of the snake with one of his four hands. See Hinduism.

Krishnagar. A town of India, in Nadia district, Bengal. It is an important trade centre and rly. junction E. of the Hooghli in the Ganges delta, and it contains a missionary station and college of the Church Missionary Society. It is the seat of a diocese of the R.C. Church. Pop. 32,016.

Krishnamurti, JIDDU (b. 1895). An Indian mystic. Born May 11, 1895, at Madanapalle, he was educated privately, and in 1909 was adopted by Annie Besant. Claiming that he had been revealed to her as the vehicle of the Messiah, in 1911 she formed the Order of the Star of the East, of which Krishnamurti was made head. He came to Europe in 1912, remaining until 1921, when he started a tour of the world. He was instrumental in forming with Dr. J. H. Cousins the Brahma Vidya Ashrama, and first publicly mentioned his Messianic mission in 1925. In 1926 he inaugurated Bharata-Samaj, a ritualistic form of Hindu congregational

worship. In 1929 he resigned from the Theosophical Society, dissolving the Order of 1911, and in 1932 renounced his mission. Thereafter he lived in California. He wrote numerous theosophical publications, e.g. *The Pool of Wisdom*, 1920; *Towards Discipleship*, 1926.

Kristiansand. The sixth city and a seaport of Norway, in the co. of Vest Agder. It stands on a fjord of the Skagerak, 176 m. by sea S.W. of Oslo. Founded by Christian IV in 1641, in a beautiful position on a peninsula, it has more than once suffered by fire. The cathedral was rebuilt in 1880. The fine natural harbour, the largest on the S. coast, has fortifications, docks, and shipbuilding yards. Kristiansand is the terminus of the Sætersdal rly. It exports timber, tar, wood pulp, and fish. The Germans held it from April 9, 1940, to May 8, 1945. Pop. 24,110.

Kristianstad. City of Sweden, and capital of the län of the same name. It is an important rly. junction 350 m. S.S.W. of Stockholm. On the broad estuary of the Helge, it uses Åhus on the Baltic as its port. Here are a Renaissance church (1617), an arsenal, and law courts. There are breweries and distilleries, iron foundries, tanneries, and sugar factories. Exports include wood pulp and granite. The town was founded in 1614, was yielded to Sweden by Denmark in 1658, and often besieged in wars between the two countries. Pop. 23,024. The län has an area of 2,485 sq. m. and a pop. of 253,185.

Kristiansund. A seaport and town in the coastal co. of Møre, Norway. It is 85 m. W.S.W. of Trondhjem and is picturesquely built on four islands which enclose the harbour. A fishing and yachting centre, it received civic privileges 1742. Pop. 12,853. It is to be distinguished from Kristiansand.

Krivoi Rog. Industrial town of Ukraine S.S.R., its name meaning crooked horn. It is about 90 m. S.W. of Dnepropetrovsk and has railway connexion with principal Ukrainian cities. The iron ore mines yield about 60 p.c. of the output of the U.S.S.R., the mines having produced 16,070,000 tons during the year 1938. During the German advance in 1941 this town was evacuated on Aug. 17; it was stormed by the 3rd Ukrainian army, Feb. 22, 1944. Pop. 197,621.

Krnov. Town of Czecho-Slovakia. Krnov is 18 m. by rly. N.W. of Troppau, in the Oppa valley. Before 1918 it was an Austrian

town known as Jägerndorf, and 1938-45 was annexed to Germany. It has cloth, linen, and hosiery manufactures.

Krogh, SCHACK AUGUST STEENBERG (1874-1949). Danish physiologist, born Nov. 15, 1874, at Grenaa. He became lecturer in 1908 and professor of animal physiology 1916-45 at Copenhagen university. His research work concerned the transformation of gases in the respiratory process, and the action of the capillary vessels. It brought him in 1920 the Nobel prize for

medicine and physiology. He wrote *Respiratory Exchange of Animals and Man*, 1916; *Anatomy and Physiology of Capillaries*, 1922. He died Sept. 15, 1949.

Kronborg Castle. A building near Elsinore, Denmark, associated with the story of Hamlet. Of Gothic design, it was built by Frederick II c. 1600, and was for a time a royal residence, but later a barracks. In 1928 it was restored to its original condition.

Krone. Monetary unit corresponding to that first circulating in France (*couronne*, crown) from the 14th to the 17th century; and to the old English gold crown (*q.v.*). The krone generally corresponded to the British shilling in Austria, Hungary, Denmark, Sweden, Norway, Iceland, Czecho-Slovakia, and Estonia. The two first-named, after the inflation of their currency which followed the First Great War, abolished it in 1924.

Kronoberg. Län or county in the south of Sweden, which covers 3,826 sq. m. It is an inland area in Gothland, bounded by Jönköping, Kalmar, Blekinge, Kristianstad, and Halland. The land is drained by small streams tapping lakes, of which the biggest are Asnen, Möckeln, and Helga. The county takes its name from a royal estate and castle near Värjö (Vexjö), the capital, at the S. of Lake Helga. Pop. 153,537.

Kronstadt. This Rumanian town is described under its alternative name Brasov.

Kronstadt. Fortress, naval arsenal, and harbour of R.S.F.S.R. It is in the region of Leningrad and 20 m. W. of it, on the island of Kotlin, opposite the mouth of the Neva, in the Gulf of Finland. Its principal buildings and estab-

lishments are connected with the navy. A canal, cut through the sandbanks of the shallow head of the Gulf of Finland links it with Leningrad, but Kronstadt is ice-bound during Dec.-April. Peter the Great founded the town in



Kronstadt, Russia. The great Naval Cathedral, built in 1903-13

1703, but its name dates from 1823. The defences and naval base have been periodically improved since an attack during the Crimean War.

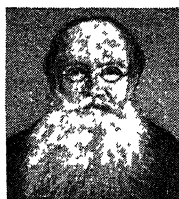
In the 1917 revolution the local government was taken over by a committee of workers' and soldiers' delegates opposed to the pro-

visional government. The Royal Navy raided the harbour on Aug. 17-18, 1919. There was a revolt against the Bolsheviks in 1921. During the defence of Leningrad, 1941, Kronstadt was used as a base for raiding the Finnish and Baltic coasts and interrupting communications behind the German and Finnish armies. Great stores of food and ammunition enabled the garrison to beat off German assaults. Seven artificial islands, all powerfully fortified, were constructed E. of the fortress.

Kroonstad. Town of the Orange Free State, S. Africa. It is 129 m. N.N.E. of Bloemfontein, and 878 m. from Cape Town, an important road and rly. junction on the Valsch river. The chief buildings are the town hall, library, and municipal offices, several churches, and the market house. It is the centre of a farming district, and a favourite pleasure resort. It lies 40 m. from the centre of a gold mining area. During the S. African War it was the capital of the Orange Free State, until the British entered it, May 11, 1900. Pop. 15,896.

Kropotkin, PETER ALEXEVITCH, PRINCE (1842-1921). Russian revolutionary and geographer.

Born in Moscow, Dec. 9, 1842, and belonging to one of the oldest families of the nobility, he was educated in the page corps of the imperial household in St. Petersburg and appointed



Prince Kropotkin, Russian revolutionary

page to Alexander II. Having accepted a commission in a Cos-

sack regiment, he spent several years in Siberia as special attaché to the Transbaikalian general governor. Leaving the army, he returned to St. Petersburg in 1867, being then a revolutionary.

As a geographer who had made important discoveries in his journeys through Siberia and Manchuria, he became secretary to the Geographical Society and distinguished himself by his original theory of the orography of Eastern Siberia. Investigations in Finland enabled him to evolve his extensive theory of the influence of the ice period on the structure of Europe.

Revolutionary Activities

Kropotkin's revolutionary views were strengthened during his journey to Switzerland and Belgium in 1872, when he came in close touch with the Socialist movement and joined the federation of the International founded by Bakunin. On his return to Russia he began revolutionary propaganda work among the working classes and they formed a group of anti-state federalists, i.e. anarchists. Kropotkin carried on his secret revolutionary work under the name of Beresin, while pursuing his scientific work under his own name. In 1874 he was imprisoned, but escaped two years later, the story being told in his *Memoirs of a Revolutionist*. One of the most popular exponents of anarchism, he worked in Switzerland, France, and England. In 1883 he was sentenced to five years' imprisonment in France for belonging to the International, but was released after having served three years of his sentence, and settled in England, which he left for Russia in 1917. He died in Moscow, Feb. 8, 1921.

Kropotkin's teaching, following up the theories of Fourier, Owen, Proudhon, and Bakunin, is communist, not individualistic, anarchism. His central theory is that of mutual aid based on a biological law which he scientifically developed in opposition to Darwin's struggle for life. According to him, community life develops a sense of solidarity which makes for stability and welfare. The fundamental principle of social order is this unwritten law of solidarity as opposed to the laws of coercion of church and state. His chief works, translated into English, are *Memoirs of a Revolutionist*, 1899; *Fields, Factories, and Workshops*, 1899; *Mutual Aid*, 1902; *Orography of Asia*, 1904; *Russian Literature*, 1905; *The Conquest of Bread*, 1906; *The Great French Revolution, 1789-93*, 1909.

Kru OR CROO. A Negro people occupying scattered villages along the Liberian coastland, W. Africa. The name loosely includes the kindred Grebo, Bassa, and other aboriginal tribes. Estimated as numbering 40,000, they are a robust, broad-chested, thick-lipped, often deep-black people with tribal marks tattooed on mid-forehead. Driven coastward by Mandingo and Fula expansion about 300 years ago, they have for generations served in the W. coast trade as surf boatmen and as cargo-lifters, and on European vessels, where they are dubbed Krumen or Krooboyes. They have urban colonies in Monrovia and Sierra Leone. See Negro.



Kru man from Liberia

Krüdener, BARBARA JULIANA DE WIELINGHOFF, BARONESS DE (1764-1824). A Russian philanthropist and mystic. Daughter of Count de Wietinghoff, governor of Riga, where she was born on Nov. 11, 1764, she married Baron von Krüdener, who became ambassador at Berlin and Venice. There a secretary of legation fell in love with her and committed suicide, an incident which suggested her romance, *Valérie*, 1803. Separated from her husband in 1792, she remained a notable figure in Parisian society, and was intimate with Mme. de Staël and Chateaubriand.

After her husband's death she settled on an estate inherited from her father. Influenced by J. H. Jung, Oberlin, and Mme. Guyon, she preached a system of quietism and mystical piety, and her drawing-room was the resort of rank and fashion. To Tsar Alexander I she suggested the title Holy Alliance (*q.v.*). She helped to found the Tract Society of Basel, and during 1816-17 devoted herself to the welfare of the poor driven from Switzerland and the Black Forest by famine. She then gave herself up to the belief that she was a prophetess; was expelled from Switzerland and Germany; and lost the friendship of Alexander I, whom she tried to engage in a crusade for the liberation of Greece. Just before her death, in the Crimea, Dec. 25, 1824, she said, "I have often mistaken for voices of God what were only the suggestions of my own imagination

and pride; what good I have done will remain, the evil God will mercifully destroy." *Consult Life and Letters*, C. Ford, 1893.

Kruger, (STEPHEN JOHN) PAUL (1825-1904). Boer politician. Born in the Colesberg dist. of Cape Colony, Oct. 10, 1825, he trekked into the Transvaal with his father in 1836. Having settled in the Magaliesberg region, he passed his early days in fighting and hunting, but also acquired that intense but narrow Presbyterian belief which distinguished him in the end.

Kruger soon became active in the politics of the little state. He helped to negotiate the Sand River convention in 1852, and supported Pretorius in his quarrels with rival factions and in his raid into the Orange Free State. He was concerned in the civil war of 1861-64, and afterwards became commandant-general of the Transvaal. To protest against its annexation he visited London in 1878; was dismissed from his post, took part in the 1880 rising, and was leader in the negotiations after Majuba. In 1883 he was chosen president of the Transvaal, and was re-elected in 1888, 1893, and 1898.

Kruger had to face difficult questions, and in dealing with them he remained the reactionary Boer, resisting bitterly the ideas of the more liberal among his people, while clinging stoutly to an administrative system which, already effete, grew corrupt. The opening of the gold mines brought a new train of questions that required real statesmanship. It fell to Kruger to conduct negotiations with Great Britain about the position of the Uitlanders in the Transvaal. The obstinacy of "Oom



S. J. Kruger

Paul" and the acquisitiveness of Rhodes and his followers could have only one outcome—the South African War.

In Oct., 1900, Kruger fled to Holland, and most of his remaining years were passed at Utrecht. In 1902 he wrote his memoirs. He died at Clarens, Switzerland, July 14, 1904. His body was taken to Pretoria and buried on Dec. 16 (Dingaan's day). He left a large family by his three wives. See Jameson Raid; South Africa; South African War; Transvaal. Consult Rise and Fall of Krugerism, J. Scoble and H. R. Abercrombie, 1900; The Pace of the Ox, M. Juta, 1939.

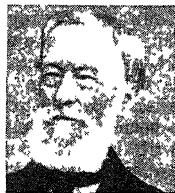
Kruger National Park. Animal sanctuary in the Transvaal, S. Africa. Originating from a suggestion of President Kruger in 1898, in which year the Sabi game reserve was opened, the park now occupies an area of 8,000 sq. m. between the Crocodile river on the S., and the Limpopo on the N., Mozambique forming the E. boundary. For the sightseer, first admitted in 1928, over 1,200 m. of motor roads have been constructed and strict game laws enforced. The tourist season is June to Oct. All kinds of wild game abound: lion, cheetah, elephant, black rhinoceros, hippopotamus, crocodile, baboon, giraffe, zebra, buffalo, blue wildebeeste, antelope, and ostrich are outstanding examples.

Krugersdorp. Town on the Transvaal, S. Africa. It is on the rly., 20 m. W.N.W. of Johannesburg, and is the chief town on the western part of the Rand. The chief building is the town hall, and there are several churches and hotels. Coronation Park is a public pleasure ground. The main industry is gold mining. The town, which was named after Kruger, was occupied by the British on June 13, 1900. Pop. 73,500.

Krumbacher, KARL (1856–1909). A German scholar and historian. Born near Kempten, in Bavaria, Sept. 23, 1856, he devoted himself chiefly to the study of the history and literature of the East Roman empire. In 1897 he was appointed professor of middle and modern Greek philology at Munich, where he lived until his death in Dec., 1909. He was the author of a standard History of Byzantine Literature, 1879, and founded the Byzantine Journal and Byzantine Record. A strong advocate of making Romaine the general dialect of Greece, he opposed the purists who desired to restore the classical idiom as far as possible.

Krupp. Name of a family of ironmasters of the Ruhr district of Germany. From about 1850 the steel and engineering plant bearing the name of Friedrich Krupp (1787–1826), who had taken advantage of Napoleon's Continental blockade to start a small steel-casting plant in his native town of Essen in 1811, expanded into one of the leading and best equipped heavy industry and engineering combines in the world. The Essen main plant had nine steel and seven rolling mills, and numerous auxiliary shops; at Rheinhausen and Engers were 14 blast furnaces, electric ovens, and mills, and five mining companies with 35 pits; at Magdeburg and elsewhere there were engineering plants; and at Kiel were the Germania shipyards. These works produced nearly every kind of metal goods including pig-iron, cash registers, weaving looms, armour-plating, locomotives, automobiles, harvesters, bridges, bedsteads, and oil-burners.

Friedrich's son Alfred (1812–87) produced the first flawless 2-ton cast-steel ingot in 1847, when he made the first cast-steel gun, the first 4-ton ingot in 1851 for the London exhibition; introduced the Bessemer process (*q.v.*) on the Continent in 1862; and gave much attention to the welfare of his workers. Under him the firm contributed to, and greatly benefited by, the building of Germany's rlys., to meet the needs of which he installed puddling furnaces, Siemens-Martin furnaces, etc., and acquired his own coal mines. The Krupp works became gun-makers for Egypt in 1856, for Belgium in 1861, for Russia in 1863, and provided the Prussian, later all German, forces with their superior breech-loading guns. At the time of Alfred's death his plants employed 21,000 workers. His son Friedrich Alfred (1854–1902) acquired plants at Magdeburg, shipyards at Kiel, etc., and introduced pension funds, savings and benevolent funds, old age and invalid homes,



Alfred Krupp, German inventor and steel manufacturer

and workers' colonies for his workpeople, who at his death numbered 43,000. His only child Bertha inherited; born 1886, she married in 1906 the diplomat Gustav von Bohnen und Halbach, a protégé of William II, who adopted the name of Krupp v. B.u.H.; the firm was transformed into a limited co. with a capital of £8,000,000, later raised to £12,500,000, held exclusively by the family.

During the First Great War, Krupp's works served as Germany's main armoury and in Essen alone employed 115,000 workers. Deprived under the treaty of Versailles of all armament-producing parts, the firm increased its production of the goods of peace, and by 1930 employed 70–80,000. Under the Nazi regime, which the Krupps, like other Ruhr industrialists, supported, the firm turned armament producer again, outstripping its gun production of the 1914–18 war (which included Big Bertha, *q.v.*). Between 1935 and 1939 Krupp's built auxiliary plants in parts of N. and central Germany supposed "safe"; between 1940 and 1945 armies of slave workers were drawn into the factories; and Krupp's plants, especially the huge works at Essen, were a frequent target of British and U.S. attacks from the air. The Essen works was scheduled for dismantling, 1947, but continued to produce non-military goods.

Krupp von Bohnen was charged at the Nuremberg trials as a war criminal, Nov., 1945; but in view of his mental and physical condition he was declared unfit to stand trial. He died, aged 79, Jan. 16, 1950. His son Alfred, head of the enterprise from 1943, was in 1948 found guilty by a U.S. military tribunal of war crimes, including plunder in occupied countries and exploitation of forced labour, and sentenced to 12 years' imprisonment with forfeiture of all property.

Krusenstern OR AILU ISLANDS. Group of islets of the Pacific Ocean. Discovered in 1816 by Otto von Kotzebue, they form part of the Marshall group, placed under Japanese mandate in 1919 and taken by the U.S.A. in 1944.

Krushevatz OR KRUSEVAC. Town of Yugoslavia. Situated on the Western Morava, 10 m. above its junction with the Morava, it is 40 m. S.E. of Kragujevatz, and is connected by the Ushitze branch with the main Belgrade-Nish rly. Once a prosperous town and still the seat of a bishop, it suffered



Baroness Bertha Krupp von Bohnen

heavily in the First Great War, being captured by the Austrians in Nov., 1915, and regained in Oct., 1918. In the early Middle Ages Krushevatz was the Serbian capital.

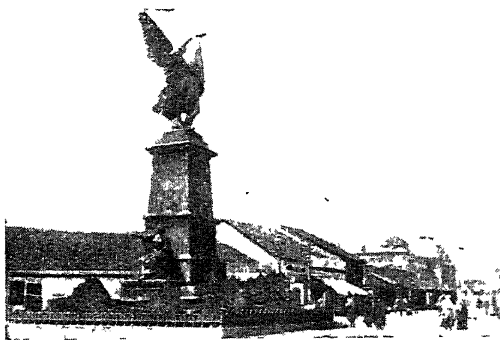
Krylov, IVAN ANDRÉIEVITCH (1768-1844). Russian writer of fables. Born in Moscow of poor parentage, Feb.

14, 1768, he wrote a comic opera before he was 14. Receiving a small appointment in St. Petersburg, he eked out his salary with journalistic and other work. When about 40 he began writing fables and in 1809 published a volume containing the first 23, which gained him the title of the Russian La Fontaine. He died in St. Petersburg, Nov. 21, 1844. Most of the fables, more than 200, were translated into English by I. H. Harrison, 1883. Consult K. and His Fables, W. R. S. Ralston, 1869.

Krypton (Gr. concealed). Chemical element (Kr.) of atomic weight 83.7 and atomic number 36. This is an inert monatomic gas contained in the atmosphere to the extent of one part in 670,000. Like the other gases (helium, argon, neon, and xenon) of this group it possesses strictly spherical molecules. Krypton may be separated from gases evolved from mineral springs, but is best prepared by fractionating the argon residue obtained by evaporation of large quantities of liquid air. The spectrum of krypton is characterized by brilliant yellow and green lines and was detected in the light of the Aurora Borealis by Ramsay in 1898.

Ksar-el-Kebir OR ALCAZAR. A town of Morocco. It is in the Spanish zone, 58 m. S. of Tangier. The nearest port is Larache or El Arish, 25 m. N.W. by rly. Between Ksar-el-Kebir and Larache is the great plain where in 1578 was fought the battle of the three kings, in which Sebastian of Portugal was killed, and an end put to Portuguese influence in Morocco.

Kshattriya OR KSHATRIYA. Second or warrior class in ancient Hindu society. They formed the military aristocracy of the Aryan immigration, charged with the protection of the community from wrong. Claiming at first both



Krushevatz. Statue to Lazar, the last Serbian tsar, whose palace was in this town

temporal and spiritual headship, they found their supremacy gradually assailed by Brahman rivalry, and it was in revolt against this tendency that Jainism and Buddhism arose. Kshattriya rank is conceded to modern Rajputs and to the ruling families of native states. Regarding Kshattriya as a caste-name, one may number half a million in Assam and Madras, with as many Khatri. mostly in the Punjab. See Caste; Hinduism.

Kuala Lipis. Town of Pahang. Federation of Malaya. Some 200 m. up the Pahang river, it is at the limit of navigation. Rubber is grown there. The rly. from Singapore to Kota Bharu runs through. See Pahang.

Kuala Lumpur. Capital of Selangor and of the Federation of Malaya. The largest town and chief rly. junction of Malaya, it was the cap. of the Federated Malay States. It stands on the Klang river, 27 m. from its mouth. Roads and rlys. connect it with the tin fields. Bombed by the Japanese on Dec. 26, 1941, Kuala Lumpur was evacuated by British Imperial forces on Jan. 11, 1942. On Sept. 13, 1945, the commander of the Japanese 29th army formally surrendered here all Japanese forces in Malaya. Pop. 138,425.

Kuala Selangor. Town of Selangor, Federation of Malaya. At the mouth of the Selangor river, it has rly. connexion with Klang and Kuala Lumpur. The Japanese infiltrated into the Selangor area in Jan., 1942, retaining possession of this town until the formal surrender in Malaya, Sept. 13, 1945.

Kuantan. Town and principal port of Pahang, Federation of Malaya. It is at the mouth of the Kuantan river, on the E. coast of the peninsula, about 175 m. N. of Singapore. Only about 30 m. of the river is navigable. In its valley one of the world's biggest

lode tin mines is situated. When the Japanese invaded Malaya from Indo-China, a small expedition landed immediately N.E. of Kuantan Dec. 9, 1941, but the town was not evacuated until Jan. 6, 1942. See Pahang.

Kuban. River of the U.S.S.R., in the Caucasus. Rising in the W. glaciers of Elbruz in Karachayev prov., it flows W. about 500 m. to form a wide, swampy delta where it debouches into the Kerch area of the Black Sea: it is navigable for 73 m. from its mouth, as far as its confluence with the Laba, but is frozen from Dec. to Feb. The name Kuban is also applied to the S.W. district of the North Caucasian region, in the neighborhood of this river. Grapes, tobacco, and sunflower seeds (providing food, oil, fuel, and potash) are among its chief products, and horses and pigs are bred. The chief towns are Krasnodar (*q.v.*) and Anapa.

During their drive for the Caucasian oilfields in 1942, the Germans forced the Kuban river in the area of Krasnodar on Aug. 17 after heavy fighting. On the lower Kuban, Cossack troops held up the Germans, while the Russian garrison was being withdrawn from Novorossiisk August 17-19. A Russian counter-offensive Jan.-Feb., 1943, drove the German armies from the Caucasus except for a bridgehead in the Kuban delta. This was attacked in Sept. and liquidated by October 9.

Kubango, OKOVANGO, CUBANGO, OR TIOGE. River of S.W. Africa. Rising in Angola, it flows S.E. in the direction of Lake Ngami in Bechuanaland. It formerly entered that lake, but its waters are now dispersed through numerous branches in the Okovango swamp and little water finds its way into Lake Ngami. In flood times the overflow enters the Zambesi.

Kubelik, JAN (1880-1940). A Czech violinist. Son of a gardener, he was born near Prague, July 5, 1880, and was taught music first by his father and from 1888 in Prague, where ten years later he made his début, a brilliant performance of Paganini's concerto in D. In London in 1900 his playing dazzled the most discriminating. After establishing his reputation in Europe, he went to the U.S.A.,



Jan Kubelik, Bohemian violinist

and made repeated world tours. During the First Great War he composed symphonic orchestral pieces and violin solos. He died in Prague, Dec. 5 1940.

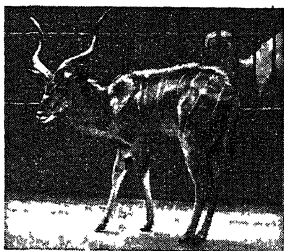
Kubinskoi. Lake of R.S.F.S.R., lying N.W. of Vologda. It is fed by 33 rivers, is 40 m. long and 10 m. wide, and provides an abundant supply of fish.

Kublai Khan OR **KUBLA KHAN** (1216-94). First Mongol emperor of China. Grandson of Jenghiz Khan (*q.v.*), he carried out vigorous campaigns under the rule of his brother Mangu. He succeeded as grand khan of the Mongols in 1259, and completed the conquest of N. China, 1260, and S. China in 1279. He founded the Yuen dynasty, which lasted until 1368, and set up his capital on the site of what is now Peiping, to rule an empire as densely peopled as any in history.

Failing response to his overtures to the pope, he turned from Rome to Tibet, and finding the Grand Lama more responsive, made Buddhism the state religion. He failed to subdue Japan, and, though conqueror of China, was deeply influenced by the ancient Chinese civilization. Marco Polo was one of the many travellers he welcomed. The magnificence of his court and the beauty of his gardens became a legend, which inspired Coleridge's poem, *Kubla Khan*. See China; Mongol; consult Book of Marco Polo, Eng. trans. H. Yule, 3rd ed. 1903.

Kuching. Chief town of Sarawak, Borneo. It is in the extreme S.W. division and on the Sarawak river, 23 m. from the coast. The trade is mostly in the hands of the Chinese. The European quarters lie on the hills on the left bank of the river. After Imperial forces had withdrawn from Sarawak, the Japanese occupied Kuching towards the end of 1941. It was bombed by Allied aircraft during the Japanese occupation, and liberated on the surrender of the Japanese at Labuan on Sept. 10, 1945.

Kudu (*Strepsiceros koodoo*). A species of large antelope, found in Africa. One of the handsomest of the family, its colour is reddish brown, with vertical white stripes; its horns are long and twisted like a corkscrew. The neck has an upstanding mane,



Kudu. Specimen of the Lesser Kudu of Somaliland

and a fringe of hair hangs from the throat. The animal, about 4½ ft. high at the shoulder, is usually found among the hills, where it feeds upon grass and shoots. The lesser kudu (*S. imberbis*) is similar but bears no fringe on its neck. See Antelope.

Kuenen, ABRAHAM (1828-91). Dutch scholar. Born at Haarlem, Sept. 16, 1828, he was educated there and at Leyden university. In



Kublai Khan. Thirteenth century portrait preserved in the Confucian temple at Chu-Fou, Shantung
From A. Waley, *Introduction to the Study of Chinese Painting*

1853 he was made professor of theology in that university, of which in 1861 he became rector, remaining there until his death, Dec. 10, 1891. Kuenen was the first to dissect the Pentateuch into its component parts and to analyse scientifically the history of the Hebrews. His writings include *The Religion of Israel*, Eng. trans. 1874-75, a work on the Hexateuch, etc. In 1882 he lectured in England, and during 1867-91 edited a theological journal, in which the results of much of his critical work appeared. See Criticism. Biblical; Hexateuch.

Kufah. Town of Iraq, 90 m. S. of Bagdad. Originally founded as a military station in 636, it became a seat of learning, and was long the residence of the caliphs of Bagdad. Kufic coins were the oldest Mahomedan gold pieces.

As Bagdad grew in importance, Kufah declined, and it is nowadays an insignificant village.

Kufic. An old form of the Arabic script, so called from Kufah in Iraq (*v.s.*). It was used in the earliest copies of the Koran, but has been superseded by Neski in

eastern Islam. The Maghreb curive script of the West is a development. See Alphabet; Writing.

Kufra. Oasis in the centre of the Libyan desert, N. Africa. It is the headquarters of the powerful Mahomedan sect of the Senussi. It comprises at least five separate oases, and is connected by desert routes with Jarabub, Siwa, and Khargeh. The oasis can be reached from Sidi Barrani, a small port between Sollum and Mersa Matruh. Until the conquest of the central Sudan by the French, completed by the Allies in the First Great War, this district was less explored than any outside the Polar regions. In 1921 Rosita Forbes after a perilous journey reached Kufra, only once before visited by Europeans, and returned across a stretch of the desert never before traversed except by Arabs. Kufra was captured from the Italians on March 1, 1941, by Free French motorised forces operating from Chad Territory under Gen. Leclerc.

Kuge. Highest social class in the Japanese feudal system of the Tokugawa era, forming the court nobility. They were all members of families who traced their descent from the early mikados, and were hereditary holders of most of the court appointments. Only nominal salaries were attached to these, and as the Kuge were not great landlords, they presented a singular feature of the Japanese social organization, with poverty as a concomitant of an intense pride of caste, which traditionally led them to confine their activities to the practice of literature and the arts. See Heimin; Japan; Samurai.

Kuhn, RICHARD (b. 1900). An Austrian chemist. A Viennese, born Dec. 3, 1900, he studied, and in 1925 secured a lectureship, at Munich. Assistant professor at Zürich, 1926, and at Heidelberg, 1929, he did outstanding work in stereochemistry and in the use of dyes for pharmaceutical purposes. At the Kaiser Wilhelm institute of medical research he became director of the institute of chemistry. He was awarded the Baeyer and Pasteur medals, and in 1938 the Nobel prize for chemistry, but was prevented from accepting it by Nazi laws.

Kuibishev. A town of the R.S.F.S.R. Formerly known as Samara, it was renamed after a revolutionary leader who died in 1935, and gives its name to a region. It lies on the Volga, 540 m. E.S.E. of Moscow. The chief products are machinery, tractors, food, and leather. As the focus of

cultural activity around the Volga, the town supports high schools, technical schools, and scientific research institutes. Built in 1586, it was important as a trading centre from the end of the 18th century when colonisation spread eastward. In Oct., 1941, as the German drive on Moscow in the Second Great War became more menacing, many departments of the central government were moved to Kuibishev, which was the provisional capital for a time. Pop. 390,267.

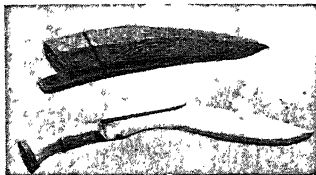
Kuka OR **KUKAWA**. A town of Nigeria. In Bornu prov., it lies W. of Lake Chad. It was formerly the capital of Bornu. The town of Gao, on the Niger, formerly the capital of the Songhai empire, was also known as Kuka, Kaougha, or Kaukaw.

Kukersite. A pale brown oil shale, of mid-Ordovician age, which occurs in Estonia and takes its name from Kukkers where it was first mined. It is not a true shale: about half the rock is organic matter (mainly algal) and 30–40 p.c. is lime, the clay content being only about 10 p.c. Kukersite is so rich that it can be used as boiler fuel without preliminary treatment, and in this form has played an important part in Estonian economy. From 1930 there has been a steady increase in the amount used for the production of oil.

Kuki. Collective name for hill-tribes in Assam of Tibeto-Burman stock and speech. Nearly a million, mostly in Manipur, they are a short, warlike, and industrious people. They occupy pile-houses, occasionally practise head-hunting, and retain much decadent matriarchal custom and animism.

Ku-Klux Klan (Gr. *kyklos*, circle). Secret society formed in the southern states of America in the period of reconstruction following the Civil War. During that time the original southern whites were much oppressed by the associations of former negro slaves, stimulated into activity as political machines by vote-catching "carpet baggers" from the north. The Ku-Klux Klan originated at Pulaski, Tenn., in 1865, as a secret social club of young white men. It became a secret police force with an elaborate constitution, the main purposes of which were to oppose coloured influence in government and society, and to prevent any intermingling of the races. At its head was a former Confederate cavalry leader, Gen. Forrest, who, under the style of

Grand Wizard, claimed to rule the south or "Invisible Empire." Each of the S. states was known as a realm, over which presided an official called a Grand Dragon; each county or "province" had its Grand Giant; a group of counties or "dominions," a Grand Titan; local units or "dens," a Grand Cyclops. Officers of the staff had equally fantastic names, and each member was called a Ghoul.



Kukri. Gurkha weapon with curved blade; above it is the sheath

To control the negro, play was made upon his superstitions. Bands of armed men, draped in white, wearing hideous masks, and carrying skulls with coals of fire for eyes, rode abroad at night. Undesirable whites as well as negroes were driven away, ostracised, or murdered. Other societies, of a similar kind were formed, and in 1871–72 laws were passed for their suppression.

In 1915, when little more than a memory, the name Ku-Klux Klan was revived to denote an organization founded by Col. Simmons, of Atlanta, Ga. Opposition to the negro was the outstanding tenet of this new body, which was not usually guilty of such excesses as its predecessor. Another difference was that it was hostile also to Jews, Roman Catholics, and persons of alien birth, thus approximating closely to the Know-Nothing movement before the Civil War. Its appeal was nationwide, though it still drew its chief strength from the south.

Before the Democratic national convention met in 1924, Senator Underwood, of Alabama, declared that the K.K.K. would provide the paramount issue for the party, and at the convention a proposal to act against it failed of insertion in the party programme by only one vote. Underwood's opposition to the K.K.K. alienated many Democrats and did much to prevent his securing the presidential nomination. The body won successes in the congressional and state elections of 1924 and 1926, but was unable to prevent the nomination of Al Smith for the presidency in 1928 and five successive elections of H. H. Lehman to the governorship of New York.

In 1937 Hugo Black's appointment to the supreme court was challenged on the ground of his alleged membership of the K.K.K., but he stated that he had resigned his connexion with it. *Consult*: The Ku-Klux Klan: a Study of the American Mind, J. M. Mecklin, 1924.

Kukri. Knife peculiar to the people of Nepal; best known as the hand-to-hand fighting weapon of Gurkha (*q.v.*) troops. It has the curved blade characteristic of most Asiatic swords and daggers, and is heaviest and broadest towards the point. The outer edge of the blade is thick and gradually slopes towards the inner. The military kukri is about 2 ft. in length and weighs from 3 to 4 lb.

Kuku-Khoto. Town of Mongolia now called Kweihsa (*q.v.*).

Kulak. Small farmer or landowner in Soviet Russia. As part of the five-year plan (1928–32), the farms of kulaks were combined to form communal farms (*kolkhozy*); this met with bitter resistance, the kulaks concealing their produce and even restricting output rather than submit to the enforced communal system. As a compromise, reached only when a state of famine had arisen, the kulaks were permitted to retain their private holdings, but were forbidden to employ labour. By promising the return of private ownership, the Germans in the Second Great War tried, with little success, to obtain the support of the kulaks against the Soviet government. *See* Collective Farming.

Kuldiga or **GOLDINGEN**. Town of Latvia S.S.R. About 70 m. W.N.W. of Jelgava, it stands on the Windau. There are various small industries, concerned with leather goods, making needles, and brewing and distilling. A ruined castle stands near, formerly a residence of the dukes of Courland.

Kulja OR **ILI**. Dist. and town of China. The town is situated near the Ili river, in the N.W. corner of Sinkiang prov., and does trade with Soviet Central Asia. The dist. lies between the Tian-Shan Mts. and the frontier. Russian forces occupied the town and district in consequence of the Mahomedan rebellion of 1870. New Kulja, 25 m. to the W., was destroyed during the rebellion; on the outskirts of its ruins a new town has arisen. Old Kulja, or Ili, was opened to foreign trade by treaty of 1851.

Kulm. Village of Czecho-Slovakia. In Bohemia, it is 16 m. N.N.W. of Leitmeritz. Here, Aug.

29-30, 1813, the French under Vandamme were defeated by an Allied army. Vandamme was taken prisoner, and the total losses of the French amounted to 18,000.

Kulp. A village of Turkey, in Kars vilayet. It is 20 m. S.W. of Erivan, Armenia S.S.R., on a tributary of the Aras, and is famous for its rock-salt mines, which must have been worked from an early date, tools having been found which belong to a pre-metal period. According to the legend, it was here that Noah laid in a supply of salt before entering the ark.

Külpe, OSWALD (1862-1915). A German philosopher. Born at Candau, Latvia, Aug. 3, 1862, he was educated at Liepaja, and was for a time a teacher. He studied at the universities of Leipzig, Berlin, Göttingen, and Dorpat (Tartu), after which, in 1891, he began to lecture in philosophy at Würzburg. He was professor of philosophy and aesthetics there, 1894-1909, then went to Bonn, and in 1913 to Munich. Külpe defines psychology as the science of personal experience in dependence upon the individuals who experience them. The theory of knowledge to him is the doctrine of fundamental ideas and principles as the material assumptions of all particular sciences. Association is reproduction resulting from experience; sensations which have been together in consciousness tend to reproduce one another.

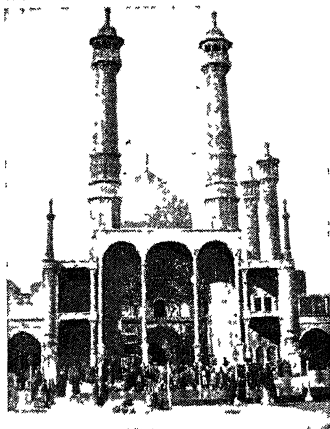
Kulturkampf. Name given to the struggle between church and state in Germany from 1870 onwards. In that year—in which the papacy lost its temporal power—the doctrine of papal infallibility was proclaimed, and provoked world-wide protests. In Bavaria the Old Catholics dissented vigorously from the new doctrine, and in 1871 their leader, Döllinger, was excommunicated. The Berlin government, alarmed by Ultramontane agitation in favour of the Holy See, secured the passing of a law forbidding the clergy to take any active part in politics. In 1872 further legislation provided for state inspection of schools and for the expulsion of the Jesuits.

The struggle reached an acute stage in 1873, when Bismarck extended the claim of civil supremacy over the Church. Several R.C. prelates were sentenced to fines, imprisonment, or deprivation for resisting the new laws. In 1874 the law was again rigorously enforced, but a general election gave the new Catholic centre sixty seats. From this time the new situation came

to be accepted as inevitable. See Germany; Papacy.

Kulu. Fertile valley of India, in the Kangra district, E. Punjab. The Beas here has the Himalayan section of its course. Deodar forests yield valuable timber. The people, all Hindus, march annually to a religious fair at Sultanpur. Kulu subdivision has an area of 1,343 sq. m. and a pop. of 138,000.

Kum OR **QUM.** Oasis-town of Persia. The capital of an administrative district of the same name,



Kum, Persia. The famous mosque known as Fatima's shrine

and one of the chief towns of Iraq Ajemi, it lies 80 m. S.S.W. and in the prov. Teheran. It derives its importance as one of the sacred places of the Shiah Mahomedans, who make pilgrimages to it. At one time a considerable city, it was partly destroyed by the Afghans in the 18th century. Pop. 30,000.

Kuma. River of the R.S.F.S.R., in the Caucasus. It rises in the N. slope of the main range in the prov. of Karachayer, flows N.E. past Georgiersk, and loses itself in the sandy swamps some 50 m. before reaching Caspian. Only in spring, when there is more water coming down, it discharges itself into the little bay of the same name on the W. shore of the Caspian, after a course of 400 m.

Kumamoto. Town of Japan, in Higo prov., Kyushu. It is on the river Shirakawa in the middle of a wide plain with the volcano Asodake in the N.E. Founded in the 16th century, it became a great feudal stronghold. It was burnt down in the Kagoshima rebellion, 1877, and little remains of its famous castle. The town is at the S. end of the Kyushu coalfield, and has rly. connexions with Moji and Kagoshima. Pop. 187,382.

Kumania OR **CUMANIA.** Name formerly given to a block of terri-

tory lying along the Danube basin towards the Black Sea. It includes what is now mostly in Rumania. The Kumanians or Cumanians were a Ugric race who gained possession of this district, as well as parts of Hungary, in the 10th and 11th centuries. The name has been limited to the area between the Thoiss (Tisza) and the Danube.

Kumanovo. Town of Yugoslavia. On the rly. from Nishto Salonica, it is 20 m. N.E. of Skoplje (Uskub), and through it passes the way to Egri Palanka and Kustendil, in Bulgaria. Cereals and poppies are cultivated. The battle fought there in Oct., 1912, which resulted in an overwhelming victory for the Serbians over the Turks, was a decisive factor in the First Balkan War, paving the way for the Bulgarian conquest of Thrace. During the First Great War, Kumanovo was taken by the Bulgars, Oct. 20, 1915, and re-occupied by the Serbs, Sept. 30, 1918; the capitulation of the Bulgarian army took place there. Pop. 14,000.

Kumasi OR **COOMASSIE.** Capital of Ashanti. About 100 m. inland, it is connected by rly. to the coast at Accra and Takoradi. Badly damaged by the British in 1874, it has been rebuilt on European lines, with churches, hospitals, schools, training colleges, and up-to-date drainage and electricity supply. Commerce concerns cattle, cocoa, and rubber. Pop. 43,413.

Kumasi, RELIEF OF. Name given to the 4th Ashanti war, 1900. At the end of the 3rd war, 1895-96, Ashanti was made a British protectorate, a resident being appointed at Kumasi. In March, 1900, tribal fighting broke out, communication between the interior and the coast was cut, and Kumasi was besieged while occupied by the governor, Sir Frederick Hodgson, and his staff, Lady Hodgson, and a small garrison. Reinforcements were dispatched from Lagos and Sierra Leone, and an expeditionary force was organized under Col. Willcocks. After much privation Hodgson, with his wife and staff, escorted by 600 native troops, cut their way through the enemy's lines; they reached Accra on July 11 by gunboat from Cape Coast Castle. Meanwhile, Kumasi was held by 100 Hausas, and its relief was effected on July 15, after two days' severe fighting, by Willcocks. When the rising had been subdued, the country was annexed 1901. See Ashanti; consult The Relief of Kumasi, H. C. J. Bliss, 1901.

Kumaun. A div. of the Uttar union, India, almost wholly in the Himalayas and bordering Nepal to the E. It contains three dists., Naini Tal, Almora, and Garhwal. Its area is 13,757 sq. m. Pop. 1,584,262.

Kumbakonam. A municipality of India, in the Tanjore district of Madras. The Mahamakam tank attracts thousands of pilgrims who bathe together, believing that the holy waters of the Ganges appear in the tank once every 12 years. Pop. 67,008, nearly all Hindus.

Kummel. Name of a liqueur, so called because cummin (*g.v.*) is one of its flavourings. Its basis is grain spirit, and it is flavoured with caraway seeds and cummin. Before the First Great War it was largely made at Riga. See Liqueur.

Kumta. Coastal town of India, in Kanara, Bombay. Cultivation is extensive; among crops are rice, pulses, and pepper. Kumta harbour is the centre of a considerable trade, though less important than formerly. The town was twice burned down by the irregulars of Tippoo's army. It is S. of the Tadri estuary. Pop. 12,466.

Kun, BELA (1886-?1939). Hungarian politician. Son of a Jewish notary, he was born near Győr, and

first studied law, but abandoned this for political journalism. Captured in the First Great War, he was a prisoner in Russia during the 1917 revolution and, inspired by Soviet doctrine, became



Bela Kun, Hungarian politician

the paid agent of Lenin in Hungary. Kun was so successful that in March, 1919, when Karolyi's government resigned, he became Bolshevik dictator. For months Kun was engaged in instituting Russian methods, but he was faced with immense difficulties and opposition. Military attacks on Czechs and Rumanians caused his downfall and he fled to Vienna on Aug. 1. Thereafter he lived mainly in Russia, holding executive positions and being from 1921 a member of the international Communist executive. While in Vienna in 1928 he was imprisoned for three months. In Aug., 1939, he was reported shot by order of J. V. Stalin.

Kunbi. An Indian agricultural caste. Numbering about 6,000,000, they are mostly in Maratha country, as well as in Oudh and Bihar (where they are known as Kurmis). They speak various

Marathi dialects, and are mostly descended from aboriginal tribes, recruited by large groups from other castes who have taken to agriculture. Their chief festival, Pola, is celebrated in the middle of the rainy season with processions of plough-bullocks.

Kundt, AUGUST (1839-94). German physicist. Born Nov. 18, 1839, at Schwerin, he became professor of physics at Zürich, 1868, at Würzburg, 1870, and in 1872 at Strasbourg. In 1888 he succeeded Helmholtz as professor of experimental physics at Berlin, a post he held till his death. His chief researches were connected with the velocity of sound in gases by the method of dust figures bearing his name. He carried out a series of investigations on the dispersion of light, showing the remarkable reversion of the spectrum in certain liquids. Kundt carried out important work in other branches of physics, e.g. the electrical properties of crystals, conduction of heat in gases, etc., but it is in the studies of acoustics and light that his work is best known. He died May 21, 1894.

Kunduz. State, town, and river of Afghanistan. The state is a mountainous region lying between Balk and Badakshan, but contains fertile valleys, which produce rice and other crops. The capital of the state is of some importance as a trade centre. The river, on which the town stands, rises in the Hindu Kush and flows into the Amu Daria (Oxus).

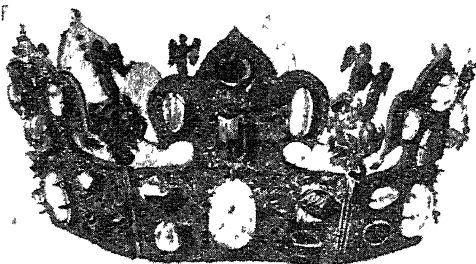
Kunene or CUNENE. River of Angola, W. Africa. Rising in the highlands and flowing 600 m. S. and W., it enters the Atlantic Ocean about 60 m. N. of Cape Frio. For some distance it forms the boundary between Angola and the S.W. Africa Protectorate.

Kunersdorf, BATTLE OF. Russian victory over Frederick the Great near Frankfort-on-Oder, Aug. 12, 1759. In his effort to save Dresden from the Austro-Russian army, numbering some 90,000 men, Frederick, with little more than half that number, attempted to envelop his enemies, and made a concerted attack on their flanks. His plans were frustrated by his subordinates, who lost their way in the woods of Kunersdorf, and failed to attack in unison. The

consequence of these tactical errors was a crushing defeat for Frederick, who lost half his army, 178 guns, and 28 colours. Through this failure Dresden fell three weeks later into the hands of the Allies.

Kunfada. Chief town and seaport of Asir, Arabia, on the Red Sea. It was one of several garrison towns held by agreement with the emir of Asir by Turkey, from whom it was captured July 10, 1916, during operations undertaken by the natives in conjunction with the Hejaz Arabs.

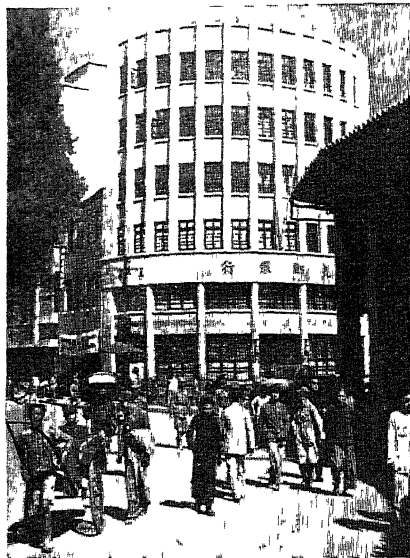
Kunigunde (d. 1037). German saint and empress. A daughter of



Kunigunde. Crown of the Empress Kunigunde, preserved in the Treasury, Munich

Siegfried, count of Luxemburg, she was married to the emperor Henry II about 1001, probably just before he secured the German throne. The empress earned a great reputation by her piety, while she and her husband are said to have taken vows of chastity. She spent much on churches and in benevolence, and is believed to have submitted to the ordeal of walking over red-hot ploughshares in order to prove her innocence of a charge brought against her. After Henry's death in 1024, she entered a convent she had founded at Kaufungen, near Cassel. She died March 3, 1037, and was canonised by Innocent III. March 3 is her festival.

Kunming. The capital city of Yunnan province, S.W. China. Also known as Yunnan or Yunnanfu, this ancient city has always had great importance as a centre for road and water traffic from the far west into central and south China. During the Second Great War it became famous as the Chinese terminus of the Burma Road and as a United States air base. It is also the terminus of the Haiphong-Yunnan rly. which (until its partial destruction during the war) was the main line of communication between S.W. China and the Indo-Chinese peninsula. As a direct result of the conflict with Japan, many basic industries formerly confined to the eastern



Kunming, China. Busy street scene backed by a modern six-storey commercial building

seaboard were transferred to the city. A number remain and have brought increased material prosperity to the neighbourhood. Pop. 248,000.

Kuomintang. Name of a political party in China. Its founder was Dr. Sun Yat-sen. In 1894 he organized the *Hsing Chung Hui*, or the Regenerate China Society, in Honolulu. In 1905 it was reorganized and renamed *Chung Kuo Tung Meng Hui*, or the China Brotherhood Society. In 1912 the Society changed its name to *Kuo Min Tang*, or the People's Party; in 1914 to *Chung Hua Ke Ming Tang*, or the Chinese Revolutionary Party; in 1919 to *Chung Kuo Kuo Min Tang*. The first two characters are usually dropped in western usage.

Since 1928, when the national govt. was formally established in Nanking, the Kuomintang has been China's ruling party under the leadership of Generalissimo Chiang Kai-shek. With the adoption of the 1946 constitution, what Dr. Sun called the period of political tutelage came to an end. The Kuomintang surrendered its supremacy and became one of several parties contending for power. Its programme was officially based on Dr. Sun's "three people's principles": nationalism, democracy, and better living standards. See China in N.V.

Kuopio. Department of Finland. Its area is 13,806 sq. m., perhaps another 2,500 sq. m. being occupied by lakes. Its N. parts

contain extensive pine forests; agriculture generally is backward. Iron ore is mined, but the inhabitants are chiefly occupied in cattle breeding, fishing, and hunting, and there is export trade in timber. Pop. 398,512. Capital, Kuopio.

Kuopio. Town of Finland, capital of the department of the same name. It is 180 m. E. of Vasa, on the W. shore of Lake Kavallesi, and the Kuvola-Kuopio rly. There is considerable trade in timber and butter. It is the centre for 700 sq. m. of lake navigation. Pop. 26,702.

Kupferschiefer (Ger., copper-slate). Black bituminous shale found in the lower Zechstein group of Permian rocks on the S. side of the Harz Mts., Germany. It reaches only 2 ft. in thickness, but is

an important source of copper, which is mined near Mansfeld.

Kuprin, ALEXANDER IVANOVITCH (1870-1938). Russian novelist. Having been a soldier, he became popular during the Russo-Japanese War by the publication of a novel, *The Duel*, 1905, in which he faithfully described the life of an officer in the Russian army. His short stories range from sinister psychology to pure comedy. They include *The Bracelet of Garnets*, Eng. trans. 1919; *Sasha*, 1920; *Yama*, 1923. After the 1917 revolution Kuprin lived in Paris.

Kur or **KURA.** River of the S. Caucasus. It rises in Turkey, near Kars, flows first N.E., then S.E. through Tbilisi in Georgia S.S.R., and discharges itself into the Caspian Sea, after a course of 800 m. largely in Azerbaijan S.S.R. It contains enormous quantities of sturgeon. It is the ancient Cyrus. With that of the Rion to the W., its valley makes a defile from the Caspian to the Black Sea. Its chief tributary is the Aras.

Kurdistan. Land of the Kurds. In its widest geographical sense the term applies to territory in Asia Minor and Persia, embracing the whole mountainous region reaching from the headwaters of the Euphrates to the shores of Lake Urmia, and from S. of Lake Van into Iraq as far as Mosul and Kirkuk. In ancient times it was a part of Assyria. Kurdistan thus includes areas under the governments of Turkey, Iraq, and Persia.

The name is applied in a stricter sense to a prov. of N.W. Persia, also called Ardalan, between Azerbaijan on the N. and Kermanshah on the S., extending W. to the Iraq frontier and E. to the provinces of Khamseh and Hamadan. Kurdistan was prominent in the fighting between Turkey and Russia in 1914-17. The treaty of Sévres, 1920, required Turkey to grant autonomy to the Kurds, but this clause was omitted from the treaty of Lausanne, 1923. In 1925 a revolt broke out against the Turkish administration, and in 1946 the Kurds in Persia rose against the government of Teheran. Both risings were soon quelled. Consult *Road Through Kurdistan*, A. M. Hamilton, 1943.

Kurds. People of mixed stock inhabiting Kurdistan (v. c.). In addition to those in the Turkish, Persian, and Iraqi areas, colonies are found throughout N. and W. Persia and around Erivan, Armenia, and Kars, Turkey. Estimated at over 3,000,000, they are a slender, straight-nosed, moustached, long-headed people—the last feature emphasised by head-deformation in the cradle—and are descended from the Neolithic Mediterranean brown race. First encountered as the people of Gutium, they became affected by aryanised Mitannian settlers, and, as the Carduchi, molested Xenophon's retreat in 400 B.C. Their most famous scion was Saladin. The Kurds are turbulent,



Kurd from uplands of Kurdistan

independent, hospitable, and display pride of race. In the Mosul plain they are sedentary. Some inhabit wintervillages or caves, and climb to summer hill pastures. Some are nomad, dwelling always in tents. Mostly nominal Sunni Muslims, they allow their women to go unveiled. Consult *Kurds: Their Origins and History*, Safranlian, 1928.

Kure. A seaport and naval station of Japan. It is situated in Honshu on the Inland Sea, 16 m. by rly. S.S.E. of Hiroshima. The surrounding district was a military strategic zone until 1945. The principal state dockyards were at Kure, together with an arsenal and a steel factory. A naval academy was established on the island of Etajima, just outside

Kure bay. Kure was bombed in 1945, and in the bay the Japanese fleet surrendered to the Allies on Aug. 14. Pop. 231,333.

Kuressaare. Estonian name for the town of Arensburg (*q.v.*).

Kurgan (Russ., burial mound). Prehistoric grave-mound in Russia. Occurring from the Carpathians to S.W. Siberia, these illustrate a cultural history of 25 centuries, down to early Slavonic times. The oldest, erected by Neolithic peoples along the megalithic track to the Yenisei, resemble the British barrow. Around Perm, so-called Chud mounds yield abundant copper and gold. Near Kerch in the Crimea are several mounds erected by Scythian potentates under Greek influence; Kul Oba contained the remains of a chief, his queen, horse, and groom, with golden ornaments of barbaric splendour. In the Kuban region, Caucasus, the Ul mound contained 400 horses. See Anau.

Kurgan. Town in Asiatic Russia. It is in Chelyabinsk prov., 250 m. S.W. of Tobolsk, on the Tobol. It takes its name from the burial mounds in the neighbourhood, where bone and iron objects and human remains have been found. The dist. is damp and swampy, and the Tobol freezes from Nov. to May. The chief occupation is stock breeding. Kurgan is on the Trans-Siberian rly., near the boundary of Europe.

Kurhaus. Literally curehouse, the German equivalent for a pump room. At spas—Homburg, Badenweiler, for instance—the kurhaus is the place where visitors go to drink the waters. Some spas have erected magnificent buildings for this purpose, providing there facilities of all kinds. See Baths; Pump Room; Spa.

Kuria Muria Islands. Group of five islands off the S. coast of Arabia. They are about 750 m. N.E. of Aden, to which they are attached. Area, 29 sq. m. They were ceded to Great Britain in 1854 by the sultan of Muscat as a landing place for the Red Sea cable. Inhabited by a few Arabs, they are mostly barren, but contain deposits of guano. The largest is Hellaniyah.

Kurile Islands OR CHISHIMA. Fescion of islands in the Pacific between Japan and Kamchatka. Until the Second Great War they were in the Japanese prov. of Hokkaido; thereafter they passed to the U.S.S.R. They include about 30 volcanic islands and nearly 50 in all, and stretch for 150 m. N.E. from Japan. Area, 3,944 sq. m.

The chief islands are Etorofu, Paramoshiri, Kunashiri, Uruppu, Shunshiri, and Onnekotan. They are hilly, with steep cliff coasts; the S. islands are inhabited and contain forests. The only harbour is Shikotan Bay, on Shikotan. In the N. snow lies from mid-Sept. until the end of July. The fisheries are valuable, cod, herring, and fin seals being obtained. The people are Ainus and Gilyaks.

The Kuriles were attacked by U.S. warships and aircraft on a number of occasions during the Second Great War before the Japanese garrison surrendered in 1945. Russian troops occupied the island of Shimushu on Aug. 22. The handing over of these islands to Russia was agreed to by Roosevelt and Winston Churchill at the Yalta conference (*q.v.*), Feb., 1945.

Kurisches Haff. Lagoon or inlet of the Baltic Sea on the coast of what was formerly East Prussia and is now in the R.S.F.S.R. It stretches for some 60 m. S. of Memel to N. of Kaliningrad, and is protected from the open sea by a thin, long ridge of shifting sand known as the Kurische Nehrung. Communication with the Baltic is afforded by a narrow channel opposite Memel.

Kurku OR KORKU. A primitive tribe in the Satpura hills and adjacent plains, mostly in the Central Provinces, India. They number 204,000, in four sub-tribes, each embracing many totemic septs. About half retain their aboriginal animism; the remainder are much Hinduised.

Kurla. Town of India, in the Salsette subdivision of Thana dist., just N. of Bombay. Kurla is at the E. end of Salsette Island. Pop. 25,000.

Kurna OR QURNA. Village of Iraq. It is situated on a narrow point of land amid date-palm groves, some 35 m. N.N.W. of Basra, at the junction of the Tigris and the Euphrates, which flow thence to the Persian Gulf as the Shatt-el-arab. In the First Great War Kurna was of commanding military importance, and a battle took place there between the British and the Turks, Dec. 4-8, 1914. The British column came from Basra by river and landed on the opposite side of the Tigris from the village. Having taken the village of Mezera, they marched up the left bank of the river, crossed it some distance above Kurna, and successfully took the Turks in the rear. See Euphrates; Mesopotamia, Conquest of; Tigris.

Kurnool. A dist., subdivision, and town of India, in Madras. The dist. lies S. of the Kistna river, bordering Hyderabad. About half is under cultivation, millet and cotton being among the chief crops. Minerals include iron ore, copper, and lead. Exports consist mainly of agricultural produce; imports of piece goods and salt. Kurnool town is an important trade centre, and contains cotton and other factories. The town is on the Tungabhadra river and the rly. from Bellary to Hyderabad. Area, dist., 7,634 sq. m. Pop., dist., 1,146,250. Town, 27,908, equally Hindus and Mahomedans.

Kuropatkin, ALEXEI NIKOLAEVITCH (1848-1925). Russian soldier. Born March 29, 1848, he entered the army in 1864, and served as a volunteer with the French army in Algeria in 1874. During the Russo-Turkish War (1877-78) he was chief of staff to Skobelev. In 1880-81 he distinguished himself by a brilliant march of some 500 m. to Geok-Tepe, and at the storming of the fortress. In 1898-1904 he was minister of war, and then was appointed to the supreme command in the war with Japan. (See Russo-Japanese War.) After the defeat at Mukden he was superseded by Linievitch, and served as commander of the 1st Manchurian army. Commander-in-chief on the Northern front, in the First Great War, in Aug., 1916, he was appointed governor of Turkistan. He was placed under arrest by the committee of soldiers' delegates on a charge of distributing arms among Russian colonists. Reduced to teaching in a village, he died Jan. 23, 1925.

Kurram. River of Pakistan, in the N.W. Frontier prov. It rises in the Suleiman Mts., in Afghanistan, and flows through Kurram, N. Waziristan, and Bannu to join the Indus. The Tochi is the chief affluent. The upper valley is of strategic importance. Lord Roberts used it in 1878, during his march towards Kabul. The Kurram and Shutargardan Passes lead across the Safed Koh section of the mts. into Afghanistan. Tirah is on the river at the foot of the Kurram, or Peiwar Kotal, Pass.

Kurram. Agency of Pakistan in the W. of the N.W. Frontier prov. The people, mostly Pathans of Turki origin, desired annexation by Great Britain in 1892. The headquarters are at Parachinar, in the upper valley; Thal, at the S. end of the dist., has rly. connections eastwards through Kohat. Area, 1,300 sq. m.

Kursk. Town of the R.S.F.S.R. It is a junction on the rly. from Briansk to Voronezh, about 300 m. south of Moscow. Kursk gives its name to a region in the highly fertile "black earth" country; this yields fruit as well as cereals, while cattle are reared, silk is produced, and there is trade in furs. The town makes machinery. It was the birthplace of S. Theodosius. In the Second Great War Kursk fell to the Germans on Nov. 3, 1941; the Russians drove out the German-Hungarian garrison Feb. 8, 1943. Pop. 119,972.

Kurumba and Kuruba. Tamil and Kanarese names of aboriginal peoples in the Nilgiri hills and adjacent plains, S. India. The hillmen are short, curly-haired, long-headed, blue-eyed, and wide-mouthed; they occupy rock-clefts or brushwood huts, and feed on roots, berries, and sodden grain. The plainsmen are hinduised Kanarese-speaking shepherds and weavers of higher culture than the hillmen.



Kurumba. Aboriginal natives of Southern India

They number about 1,000,000.

Kurussa or Kouroussa. Town of French Guinea. It is situated on the river Niger on the rly. from Konakry, with an extension to Kankan. It is a centre for the distribution of goods from the French Sudan.

Kurz, Hermann (1813-73). A German novelist. Born at Reutlingen, Württemberg, Nov. 30, 1813, he studied at Tübingen, where for the last ten years of his life he was university librarian. He died Oct. 10, 1873. He is chiefly remarkable for his beautiful rendering into modern German of the 13th century Tristan and Isolde of Gottfried, 1844, and for his translations from English and Italian. One of his most successful novels was Schillers Heimatjahre (Schiller's Home Years), 1849. His collected writings were published in 12 vols., 1904.

Kushva or Kushvinsk. Town of the region of Sverdlovsk, R.S.F.S.R., formerly known as Goroblagodat. It lies in the Ural Mts., 195 m. by rly. E. of Perm, and is a centre of heavy industry. Gold and platinum are found in the neighbourhood.

Kuskokwim or Kuskoquim. Second longest river of Alaska. Rising on the slopes of the

Alaskan Range, it flows S.W. for about 700 m. to Kuskokwim Bay, Bering Sea. It drains an area of 48,000 sq. m., and is navigable for about 500 m. from its mouth.

Küssnacht. Village of Switzerland, in the canton of Schwyz. It stands at the N. end of the Lake of Lucerne, at the base of the Rigi, 8 m. by steamer and rly. E.N.E. of Lucerne. A starting point on a bridle-path up the Rigi, it has associations with William Tell, the so-called castle of Gessler being above the village.

Kustendil. Town of Bulgaria. It is on the Struma, 40 m. S.W. of Sofia, and has been the seat of a Greek orthodox archbishop. A rly.

runs to the frontier with Yugoslavia. Pop. 16,241.

Küstrin. A town formerly in Prussia, Germany, it lies in the area occupied by Poland, 1945. Its Polish name is Kistrzyn. It is 50 m. E. of Berlin, on the right bank of the Oder at its confluence with the Werthe. The name first occurs in 1232. It became a stronghold of the Hohenzollerns in 1262, and possessed a 16th century castle. Here Frederick (afterwards the Great) was imprisoned in 1730 by his father, Frederick William I, for disobedience. The town was taken by the French in 1804. An industrial and agricultural centre, it was almost destroyed by the Russians during the Second Great War before it fell March 12, 1945, to Marshal Zhukov's forces, after holding out for three weeks as the last German bridgehead across the Oder. Pop. 17,600.

Kut. A popular abbreviation of the proper name, Kut-el Amara. This is a town of Iraq, on the Tigris, 290 m. up river and N.W. from Basra. It is all but encircled by the river, which forms a U-shaped loop here. Until the First Great War it was a drab collection of squalid buildings and mud huts, inhabited by a few thousand

Arabs. Destroyed in 1915-17 by gunfire, it was reconstructed by the British after the conclusion of the war. An imposing colonnade bazaar was built along the river front, and the flats and shoals in the middle of the Tigris were converted into vegetable gardens. A British war cemetery is near. Kut is the chief town of a liwa with a pop. of 180,145.

SEIGE AND BATTLES OF KUT. After his capture of Amara from the Turks on June 4, 1915, the British General Townshend was ordered by General Nixon, commander of the Mesopotamian expeditionary force, to push on with his 14,000 men and take Kut, with the object of using that place as a base for the capture of Bagdad. Although the advance entailed a rash adventure some 200 m. up-country with insecure lines of communication and a weak supply system, the risk was held justifiable in the hope of achieving some success to counteract the Gallipoli failure.

Townshend began his advance on Aug. 1, and, supported by a light naval flotilla, proceeded along both banks of the Tigris. By Sept. 26 he was within 4 m. of the main Turkish defences of Kut—manned by 8,000 first class regular troops and a force of Arab auxiliaries. Next day the British moved along both banks of the Tigris, the main force being on the S. When within 2 m. of Kut the troops on the N. bank entrenched, causing the Turks to believe that the chief assault would be from the S. Overnight Townshend transferred the bulk of his troops to the N., on the 28th he launched the main assault, and by a flanking movement came in the rear and routed the Turkish reserves. The enemy, having lost 4,000 men, against a British loss of 1,233, withdrew from Kut, which was occupied by the British on Sept. 29.

Nixon then ordered Townshend to advance on Bagdad, but the latter came up against strong opposition at Ctesiphon, and on Nov. 22 was heavily defeated with the loss of 4,000 men. Compelled to retreat on Kut, he prepared for a siege by sending his cavalry to Amara and removing his casualties to Basra. Between Dec. 8 and 24 the Turks made several attempts to take the place by assault, but were repulsed with such heavy losses that they decided to reduce Kut by starvation.

Meanwhile British reinforcements were ordered from India, and a Russian army advanced

through Persia to the relief of the garrison. On Jan. 13, 1916, a British relief expedition under Gen. Aylmer, moving up from Ali-el-Gherbi, was defeated at Umm-el-Hanna. Word was received from Townshend that by strict rationing of food and water he could hold out for 84 days, and Aylmer postponed any further attempt to advance until March 7, when he was again repulsed, this time at Shatt-el-Hai.

Aylmer was replaced by Goringe, who, considerably reinforced, made great efforts to pierce the Turkish lines at Sanna-i-yat, N.E. of Kut. All were beaten off, and with the failure of the last attack, Kut was doomed, as the British had neither reserves nor equipment for further efforts. Townshend had only scanty supplies reaching him by aeroplane, while the besiegers were constantly reinforced. Other Turkish divisions, from Gallipoli, effectually halted the Russians. On April 29 Townshend surrendered after a siege of 143 days.

This brought repercussions throughout the Middle East, damaging British prestige; and the Turks were enabled to concentrate all their strength against the Russians in Armenia. Of 2,680 British officers and men taken at Kut, 1,306 died in captivity and 449 were never traced. The fate of the 6,000 Indian troops was even worse; forced by the Turks to make their way across the Syrian desert, all perished on the march. A further 20,000 British and Indian troops had become casualties in the various attempts to relieve Kut.

Responsibility for the fall of Kut is not easy to assign. In official circles Townshend was

strongly criticised, but in the popular imagination he became a hero; it was ultimately admitted that his forces had been quite inadequate to the task laid upon them. The weakness of the relieving expeditions lay in their lack of transport.

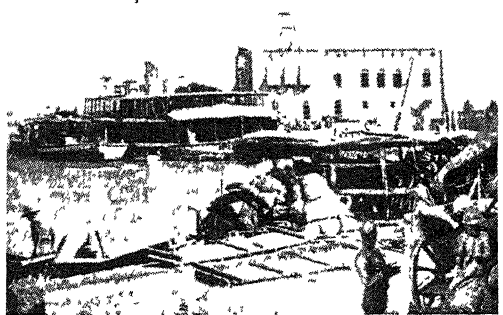
In Dec., 1916, preliminary operations were begun for the recapture of Kut. A rly. was built from Sheikh Saad, suitable vessels were put on the Tigris, and a new and large army under Gen. Maude advanced to within 7 m. of Kut, where the army was divided, one half moving on the S. bank of the river and the other on the N. On Jan. 19, 1917, the S. force drove the enemy out of the Khadairi Bend, but on Feb. 16 was held at Sanna-i-yat. On Feb. 22, however, and next day, its commander, Gen. Cobbe, took the whole position. Maude entered Kut a few hours later. *Consult* In Kut in Captivity, C. W. S. Sandes, 1919; My Campaign in Mesopotamia, Sir C. Townshend, 1920; Loyalties: Mesopotamia, Sir A. Wilson, 1931.

Kutais. A town of Georgia S.S.R. It is about 110 m. W.N.W. of Tbilisi, on the river Rion and on the Poth-Batum rly. The chief occupations are hat making and trading in silk and cloth. Silk and grapes are cultivated in the area. Kutais, the ancient Kotatision, occupies the site of Aea, capital of the old kingdom of Colchis. Long the capital of Georgia, it was occupied by Russia in 1810. Pop. 81,479.

Kutaya, KUTAHIA, OR KINTAYAH. Town of Asiatic Turkey, the ancient Cotyaeum. Situated 75 m. S.E. of Bursa, and connected by rly. with Izmir rly., it is an important trade centre. It manufactures carpets and pottery, and nearby are deposits of meerschaum. It gives its name to a vilayet with pop. 384,318.

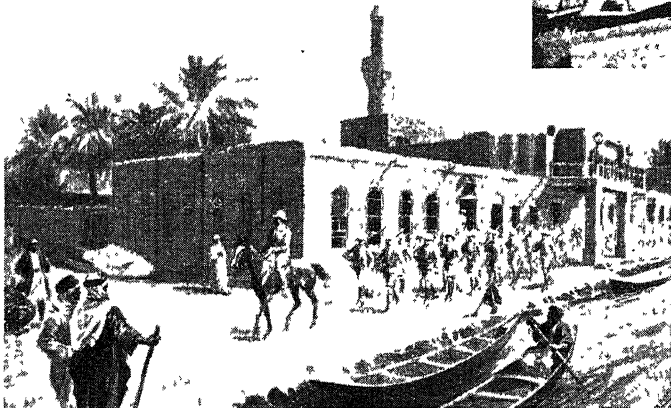
Kut Barrage. Dam and irrigation scheme in Iraq. The barrage regulates the supply of water for irrigating areas formerly served by the uncontrolled flow from the Tigris into the Shatt-el-Gharraf. At the cost of the Iraq government, preliminary work started in 1923, and the whole project was officially opened by King Ghazi on March 28, 1939. The work was carried out by a British firm and cost £1,120,000. The whole plant, together with 60,000 tons of cement and 10,000 tons of steel, was shipped from Great Britain to Basra and thence 300 m. by barge up the Tigris. Total length of the barrage and its lock is 1,615 ft., and the dam across the main stream has 56 electrically operated gates.

Kutno. Town of Poland. It is in the govt., and 80 m. W., of Warsaw, on the Ochnia, and is a station on the Torun-Warsaw rly. There are important sugar factories, and sugar beet is especially



cultivated. Weaving and dyeing are also carried on. Fighting occurred here between the Russians and Austro-Germans in the First Great War.

Kutusov, MIKHAIL ILARIONOVICH (1745-1813). Russian soldier. Born in St. Petersburg, Sept. 16, 1745, he entered the army as a youth. He served against the Poles and the Turks and gained some reputation, which he enhanced by his conduct in a further war against Turkey (1788-91), in which he held a high command. Before this he had been governor-general of the Crimea,



Kut, Iraq. British troops marching through the riverside part of the town. Top, right, landing place on the Tigris, during the British occupation

and after it he was governor-general of Finland; he was also for short periods ambassador in Constantinople and Berlin. In 1805 he commanded the army that defeated the French at Dürrenstein, and he was wounded at Austerlitz. During 1806-11 he was



M. I. Kutusov,
Russian soldier

governor-general of Lithuania, and in 1812 commander of the army that opposed Napoleon's advance into Russia. He led it at Borodino, followed the French on their retreat, defeated a part of their army at Smolensk, and was still on active service when he died, March 25, 1813. He had been made a field-marshal and prince of Smolensk. A fine picture is given in Tolstoy's *War and Peace*.

Kuvera. God of wealth, and one of the principal gods of Hindu mythology. He now shares the disregard into which the majority of those many gods have fallen.

Kuwait. This Arab state is also spelt Koweit and so entered here.

Kuyper, ABRAHAM (1837-1920). Dutch statesman. Born at Maassluis, Oct. 29, 1837, he attended Leyden university and entered the Dutch Reformed Church. By 1876 he was leader of the Christian anti-revolutionary party in Amsterdam. In 1872 he had founded the *Standaard*, which he edited until 1920. He started a Calvinist university in Amsterdam, and in 1886 headed the orthodox party which separated from the Reformed church. Elected to the states-general by *Sliedrecht* in 1894, in 1901 he became prime minister and minister for home affairs. His efforts to negotiate a settlement in the S. African War were unavailing, but he held office till 1905. From 1913 he sat in the upper house. He died Nov. 8, 1920.

Kuyunjik or **KUYUNJIK.** Village on the left Tigris bank opposite Mosul, Iraq. In 1820 Rich identified its ruin-mounds as forming part of Nineveh. Palaces of Sennacherib and Ashurbanipal, with numerous other remains, were excavated by Botta, 1842; Layard, Rawlinson, and Rassam, 1845-55; Smith, 1873-76; Rassam, 1877-83; Budge, 1888-89; King, 1902.

Kuzbass. The Kuznetsk basin in W. Siberia, R.S.F.S.R. Extending N. from the foothills of the Altai

Mts., it is a major industrial area of the country. In 1913 it yielded 4 p.c. of Russia's coal; in 1939, over 15 p.c. The basin is estimated to contain 400,000 million metric tons of coal, and supplies the whole Ural industrial region. There are also deposits of iron ore and manganese.

Kuznetsk. There is more than one town of this name in Russia and Siberia, but the principal one, from which the Kuzbass is named, is now called Leninsk-Kuznetsky (*q.v.*).

Kwakiutl. Group of American Indian tribes in Vancouver Island and on the adjacent mainland of British Columbia. About a thousand, they constitute, with the Nootka, the Wakashan stock. They maintain the native credit-system called *potlatch* (*q.v.*), and are governed by secret societies.

Kwangchow Wan. A former French concession on the coast of Kwangtung, China, renamed Chankiang (*q.v.*).

Kwangsi. Province in S. China. Covering 85,452 sq. m., it contains 99 counties and two municipalities, with Kweilin as its capital. Other important cities are Liuchow, Nanning, and Wuchow (a river port for exports to Canton and Hong Kong). The Hunan-Kwangsi and the Kwangsi-Kweichow rlys. run through the province, which is connected by highway with Indo-China. The principal products are rice, woven woollen, silk, and cotton fabrics and garments, and wooden toys. The country around Kweilin is known for the grandeur of its scenery. The Sikiang traverses the S. of this prov., where floods are frequent. The Taiping rebellion of 1860 began in Kwangsi. Pop. 14,861,470.

Kwangtung. Most southerly seaboard province of China. Its area is 85,447 sq. m., and pop. 32,338,795. There are 98 counties and three municipalities, with Canton as capital, other cities being Kukong, the port of Swatow, and Pakoi. The island of Hainan is part of the prov. Chungshan was the birthplace of Sun Yat-sen, founder of the Chinese republic. The Canton-Hankow, Canton-Kowloon, and Canton-Samshui rlys. run through the prov., and good highways connect sea and river ports with the interior. Coastal trade is carried on with Hong Kong, Macao, and Chinese ports. Principal products are rice, fish, tropical and candied fruits, and silk. Matches are made, and tungsten mining has been

begun. There are several distinct races in the province, in various stages of civilization.

Kwannon Tunnel. A railway tunnel under the Shimonoseki Straits, Japan. The tunnel links the port of Shimonoseki, on Honshu, with Moji, on Kyushu, and runs under water for 1½ m. It was completed in 1941 after nearly five years' work at a cost of about £2,500,000. The first train passed through the tunnel on March 27, 1942, the route saving nearly 9 hours in the journey from Tokyo to Kagoshima.

Kwantung. Territory in Manchuria, at the S. of the Liastung peninsula. Covering, with neighbouring islands, 1,338 sq. m., it includes the towns of Dairen and Port Arthur. China leased the territory to Russia for 25 years from 1898, but after the Russian defeat by Japan the lease passed in 1905 to the latter. Kwantung was handed back to China in 1945. Cereals, rice, hemp, and tobacco are grown, while there are fisheries and salt manufacture. There is rly. connexion with Mukden. Pop. 1,656,726.

Kwanza, COANZA, CUANZA, or QUANZA. River of Angola. Rising in the centre of the country, it flows generally N.W. to the Atlantic, which it enters 30 m. S. of Loanda. It is navigable for 120 m., as far as the Cambambe rapids.

Kweichow. Province of S.W. China. It is largely a plateau between the upper Yang-tse and Sikiang. The area is 68,139 sq. m.; divided into 80 counties. Kweichow is the capital, and important cities are Tsunyi, Tungjen, and Chenyuan. Railways are the Kwangsi-Kweichow, Hunan-Kweichow, and Szechwan-Kweichow lines. Agriculturally poor (growing small quantities of rice, wheat, and maize), Kweichow produces mercury and other minerals. Timber resources are declining. The Miao tribes live in the mts. Pop. 10,557,397.

Kweihwa or **KUKU-KHOTO** (The Blue City). Town of Inner Mongolia, in Suiyuan prov. It was formerly the residence of the Mongolian Living Buddha, who moved to Uрга, and is still a centre of Lamaism. It is on a rly. to Peking and a caravan route to Outer Mongolia which carries a trade in tea, skins, and furs.

Kweilin. Capital of Kwangsi province, China, on the Cassia river (or Kwei-Kiang). There is junk traffic with Wuchow, and a trade in skins and silk. Pop. est. 80,000.

Kweiyang. Capital of Kweichow province, China. It lies at 3,400 ft. alt. on the main road from Peking to Yunnan and Burma. Pop. est. 100,000.

Kwenlun. Great system of ancient folded mountains stretching E. from the Pamirs in the N. of India for over 2,000 m. It forms the N. boundary of Tibet and, under other names, sweeps across China. In the W. an alt. of over 20,000 ft. is attained.

Kyanite. **CYANTITE**, OR **DIS-THENE**. A mineral, one of the three aluminium silicates ($\text{Al}_2\text{O}_3 \cdot \text{SiO}_2$) with closely related structures—kyanite, andalusite, sillimanite. The first crystallises in the triclinic system, usually as long, thin, blade-like crystals, sometimes in radiating rosettes, often light blue in colour. Kyanite is considered characteristic of metamorphosed argillaceous rocks; also in certain highly metamorphosed basic igneous rocks; occasionally in quartz veins. Mined extensively in India and Kenya, it is used to line furnaces.

Kyasht, LYDIA (b. 1886). Russian dancer. Born at St. Petersburg (Leningrad), March 25, 1886, she trained at the school of the imperial theatres there and studied under Cecchetti (*q.v.*). She came to London in 1908, making her debut at the Empire Theatre, and later succeeded Genée as première danseuse there. After the First Great War she appeared in cabaret, and in 1935 founded her own dancing academy, and in 1939 the Ballet de la Jeunesse Anglaise. She published *Romantic Recollections*, 1929.

Kyaukpyu. District, subdivision, and town of Arakan division, Lower Burma. The district, which consists of a portion of the mainland, the islands of Ramree and Cheduba, and numerous little islands, contains extensive forests. The area under cultivation is small, and nearly all of it is devoted to rice. The minerals include petroleum, iron, and coal. Kyaukpyu town, on the N. coast of Ramree Island, is the centre of a small trade with Rangoon and Calcutta. Area of district, 4,387 sq. m.; subdivision, 594 sq. m. Pop., district, 253,000; subdivision, 61,900; town, 4,600.

Kyaukse. District, subdivision, and town of Meiktila division, Upper Burma. About one-fifth is under cultivation; of the cultivated area about four-fifths is devoted to rice. The minerals include sandstone, limestone, and marble. The transit trade of the

district is considerable. Imports include piece goods, while rice is exported. Kyaukse town has a small local trade, and is on the rly. from Rangoon to Mandalay. Area of district, 1,274 sq. m. Pop., district, 152,506; town, 6,400.

Kyd, THOMAS (c. 1558–1594). English dramatist. The son of a London scrivener, he was educated at Merchant Taylors' school, where he had Spenser as a school-fellow. He translated Garnier's tragedy *Cornélie*, probably wrote *Soliman and Perseda*, and was the author of *The Spanish Tragedy*, a popular Elizabethan play of revenge which, in a measure, anticipated Shakespeare's *Hamlet*. The lost pre-Shakespearian play of *Hamlet* is usually ascribed to him. He was imprisoned in 1593 on a charge of atheism, and died in poverty. His works were edited by F. S. Boas, 1901.

Kyffhäuser. Mountain of Germany. It lies about 14 m. E.S.E. of Nordhausen, to the S. of the Unter Harz, from which it is separated by the Goldene Aue (Golden Meadow). Rising to a height of 1,500 ft. it is dominated by the



Lydia Kyasht, Russian ballerina, who danced much in London

ruins of a castle once belonging to the Hohenstaufen. Tradition connects the district with Frederick Barbarossa, who is said to sleep beneath the old castle until Germany's ancient glory revives. Rückert has a poem on this theme. On the S. side of the range is a cavern known as Barbarossa-Höhle with underground lakes. Close by the Oberberg is a huge monument erected to the memory of the emperor William I.

Kyle. District of Ayrshire, Scotland. One of the old divisions of the county, it lay between the

rivers Doon and Irvine. It was divided by the Ayr into King's Kyle and Kyle Stewart, and is associated with Burns.

Kylemore. Pass, lough, and castle in co. Galway, Eire. They are in the N.W. of the co. between Letterfrack and Leenane. The mts. rise on either hand to 2,000 ft., their lower slopes being wooded, and the road passes over the lough. Kylemore Castle, a seat of the duke of Manchester, is a picturesque castellated structure of granite, faced with limestone, and dates from 1864. The interior is richly decorated with Connemara marble. See Connemara.

Kyles of Bute. Narrow, curved channel separating the island of Bute from the mainland of Argyllshire, Scotland. Famous for its scenery, it extends for about 16 m. and is seldom more than one m. in breadth. See Bute.

Kylsant, OWEN COSBY PHILIPPS, BARON (1863–1937). British merchant. Born March 25, 1863, a son of Canon Sir James Philipps, he became chairman of the Royal Mail Steam Packet co. in 1902. He was Liberal M.P. for Pembroke and Haverfordwest, 1906–10, but later became a Conservative and sat for Chester, 1916–22. He was created a baron in 1923. In 1931 he was sentenced to 12 months' imprisonment for circulating a false prospectus, but it was generally felt that he was the victim of circumstances. He died June 5, 1937, leaving no heir.

Kymograph (Gr. *kyma*, wave; *graphein*, to write). Name given to an instrument for recording cyclic operations. It is applied, e.g., to the device for recording the revolutions of an aeroplane propeller in flight. In physiological work it comprises a revolving drum on which a stylus records muscular contractions, pulse waves, respiratory movements, etc. The apparatus responsive to the patient's movements had various forms; in one due to Fick, a curved hollow spring is filled with alcohol. One end is sealed and connected to an amplifying arrangement of levers, while the other is connected to a T-shaped tube in a blood-vessel. The extremity of this lever is a writing point in contact with the revolving recording cylinder.

Kymoscope (Gr. *kyma*, wave; *skopein*, to look). Term applied to an instrument for the detection of electromagnetic waves. It may be based on thermal, magnetic, electrodynamic, or electrolytic

effects. The coherer and thermionic valve are examples of kymoscopes.

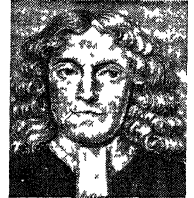
Kynance Cove. A beach in Cornwall, England, lying $1\frac{1}{2}$ m. N.W. of the Lizard. It is remark-

dates from the city's foundation in 794, from which year until 1869 Kyoto was the Japanese capital.

Situated on a plain with mountains on three sides and access to

addressed to each Person of the Holy Trinity, western usage changing the second invocation to Christe Eleison. In the Book of Common Prayer the Greek words are translated and generally precede the Lord's Prayer, except when that prayer is used in the Communion service, and the petition occurs in the Litany, and after recitation of each of the ten commandments. In the R.C. mass the Kyrie follows immediately after the Introit (*q.v.*).

Kyrle, JOHN (1637-1724). An English philanthropist, commonly known as The Man of Ross. The son of a barrister, he was born at Dymock, Glos., May 22, 1637, and educated at Balliol College, Oxford, which he left to settle on



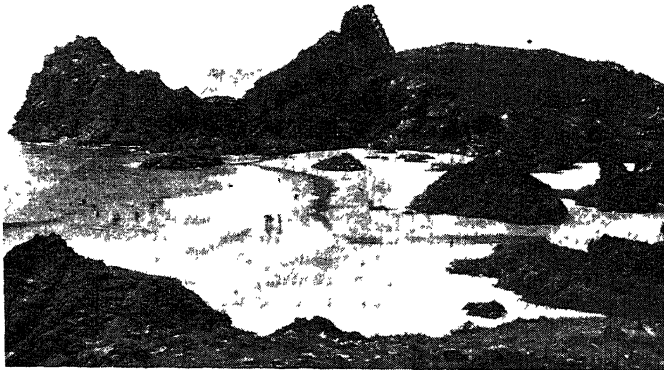
John Kyrle, English philanthropist

Ross, in Herefordshire. A benefactor to the poor in this town and interested in all philanthropic work, he became sheriff in 1683. He died Nov. 7, 1724. He is best known from the eulogy in Pope's Third Moral Epistle, 1732, and by an early poem of Coleridge. See Ross.

The Kyrle Society, a philanthropic socy. was founded in 1877.

Kyushu. An island of Japan. The most southerly of large islands forming the Japanese archipelago, it lies S.W. of the Inland Sea, and with 373 small islands has an area of 16,247 sq. m. The coalfields of Chikuzen and Buzen—largest in Japan—lie in the N. part. Mountains do not run to lofty peaks, but Asodake, an active volcano, has the largest crater in the world, its walls being almost 2,000 ft. high and basin up to 17 m. across. Other notable mts. are a volcano

on the island Sakura-jima, in the Gulf of Kagoshima, which erupted in 1914, and Kirishima-yama, sacred to the god Ninigi. The capital is Nagasaki (*q.v.*), and other cities include Kagoshima, Fukuoka (where in 1910 was established an imperial university), and Kumamoto. Pop., with small is., approx. 9,000,000.



Kynance Cove, Cornwall. Beauty spot on the coast of the Lizard peninsula; the vivid colouring of the serpentine rocks is especially memorable

able for silvery sand backed by coloured serpentine cliffs and rocks in picturesque groupings which makes this one of the most beautiful spots on the British coast. It is unspoiled, being approached only by footpath and a very rough privately-owned motor road, which ends on the cliffs some distance from the cove.

Kynoch Smokeless Powder. English propellant for sporting guns. It is somewhat unusual in having the nitrocellulose gelatinised with dinitrotoluene. Its composition is nitrocellulose, 53 p.c.; dinitrotoluene, 20 p.c.; potassium nitrate, 1.5 p.c.; barium nitrate, 22.5 p.c.; wood meal, 3 p.c. See Explosives.

Kyosai Shofu (1831-1889). A Japanese painter. He was born at Koga and was largely self-taught. Though he received no training at the hands of Hokusai, he became one of the best known of his followers. Yet Kyosai showed nothing of the copyist in his work, for he was a splendid draughtsman and probably the most versatile and daring caricaturist that the empire ever produced. There is a small representative collection of his work at the Victoria and Albert Museum, London.

Kyoto. A town and former capital of Japan. Situated on the island of Honshu, it is an important rly. junction 27 m. N.N.E. of Osaka. The centre of Japan's art industries, it manufactures bronze and cloisonné ware, fans, silks, and lacquer goods. Silk weaving



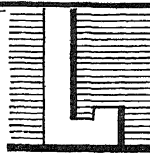
larger plains on the S., the city receives water for electrical purposes and irrigation by a canal from Lake Biwa. In addition to the imperial palaces there are numerous educational institutions. An imperial university was founded in 1897. Electric trams and the canal provide transport. Pop. 1,089,726.




Kyphosis (Gr. *kyphos*, hump-backed). Increase of the dorsal convexity of the spine, such as produces the condition known as hump-back. It is most often due to rickets, tuberculosis, or fracture. See Hunchback; Spinal Column.

Kyrie Eleison (Gr., Lord, have mercy). Form of supplication frequently used in the services of the Christian Church, and sometimes called the lesser Litany. It is common to all ancient liturgies, and was repeated three times, as being



Kyoto, Japan. Gion-machi, the chief street in the pleasure quarter. On the right is seen one of the fabulous creatures of stone guarding the entrance to a Shinto temple

THE Egyptian hieroglyph (5000-4000 B.C.) most nearly corresponding to the letter L is assumed to be one representing a lioness. Of this pictograph the hieratic version (3000-2000 B.C.) was , in which resemblance to the modern letter can already be discerned. The Phoenicians and Hebrews simplified the form thus: , giving it the name *lamed*, signifying "ox-goat," from its likeness to that object. The earliest Greek forms show an inversion of the letter, which 

became the classic Greek *lambda* , with the minuscule form λ . The Roman letter, however, reverted to the Phoenician style , which was formalised into the classic Roman L, the horizontal line of which was in the best examples only half the width of the vertical. In cursive script (7th cent.) the greater length of the vertical was emphasised, thus: , and this accounts for the familiar l of modern typography. The looped vertical, common in modern handwriting, is also met with in medieval MSS.

L Twelfth letter of the English and Latin alphabets, one of the two liquid consonants, R being the other. When sounded it has the soft sound heard in *lamp*, *let*. In words of one syllable after a simple vowel, but not a diphthong or compound vowel, it is generally doubled, as in *fall*, *mill*. The termination *le*, as in *table*, *amiable*, is pronounced as if written *el*, the *e*, however, being almost inaudible. L is silent in many words, e.g. *calif*, *could*, *half*, *talk*. As a symbol in chemistry L = lithium; in Roman notation L = 50; and in financial usage £ (a symbol derived from the medieval "black-letter" form of the letter) represents pound (Lat. *libra*) or pounds sterling. See Alphabet; Phonetics.

Laager. Afrikaans word for a defensive encampment formed by placing the wagons of a convoy in a ring. This arrangement, in the event of attack by savage tribes, provides some protection from arrows, spears, and similar missiles. A laager system of defence was adopted by armoured formations in the N. Africa campaigns of the Second Great War while halted for the night. The nearest word in English is leaguer, occurring in be-leaguer.

Laaland OR **LOLLAND.** Island in the Baltic, belonging to Denmark. Its area is 447 sq. m. It lies between Falster on the E. and Langeland on the W., and is separated from Holstein by the Fehmarn Belt. As its name (lowland) implies, it is low and level, its maximum alt. being only 95 ft. The soil is fertile, and there are forests of oak and beech. It has a broken coastline, and contains a few small lakes. There is trade in hops, hemp, timber, and corn. Maribo is the capital—this being an alternative name for the island; other towns are Raksøv, Sæxkjøbing, Nysted, and Bødby.

Laar OR **LAER, PIETER VAN** (1582-1642). Dutch painter, also called Bamboccio and Snuffelaer. He studied under Jan van Campen and Adam Elsheimer, painted

genre in landscape settings, and his rare pictures of rural fairs and hunts are drawn with much spirit. Two visits to Italy supplied him with effective backgrounds. He died at Haarlem.

Labadie, JEAN DE (1610-74). A French religious reformer. He was born at Bourg-en-Guienne,



Jean de Labadie,
French mystic

Feb. 13, 1610, and educated at the Jesuit college at Bordeaux. Separating from the order in 1639, he became a popular preacher. Protected by Richelieu, he was expelled by Mazarin, and having, while at the Carmelite hermitage at Gravelle, read Calvin's Institutions, he in 1650 seceded to the Reformers. Preacher and professor of theology at Montauban, he was pastor at Geneva and Middelburg, where in 1666 he started the community known as the Labadists, which practised community of goods. Suspended in 1668 for refusing to subscribe to the Belgic Confession, and expelled, he secured the support of Anna Maria Schurmann, and settled at Herford, Westphalia, where he drew up a regular organization for his followers, who, however, were banished in 1672 to Altona, where Labadie died, Feb. 13, 1674.

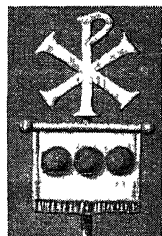
The Labadists then moved to Wiewert, N. Holland. Later they attempted to found colonies at Surinam and at New Bohemia, on the Hudson river, U.S.A. They disappeared about the middle of the 18th century. In some respects resembling the Anabaptists and the early Quakers, they taught that the children of the regenerate were born without original sin.

Laban. Biblical character; the uncle and father-in-law of Jacob. The latter worked for him as a shepherd for 14 years, obtaining after the first seven Leah, and

after another seven Rachel, as brides. The story is recounted in Gen. 29.

La Barca. Town of Mexico, in the state of Jalisco. It lies E. of Lake Chapala and 60 m. S.E. of Guadalajara on the rly. to Mexico city. It trades in oranges and other fruits. La Barca dates from 1529. Pop. 10,370.

Labarum. Standard of the Roman army in Christian times. It is said to have been adopted by Constantine the Great after his conversion to Christianity, owing chiefly to the miraculous vision of the Cross which appeared in the sky, bidding him conquer, before the engagement with Maxentius (q.v.). According to Eusebius, the labarum consisted of a spear, surmounted by a crosspiece, from which was suspended a square silken banner. It bore the monogram XP, the first two letters of the Greek Christos. See Cross.



Labarum. Roman standard adopted by the Christian emperors
Adapted from a coin of Constantine

La Bassée. Town of France, in the dept. of Nord, 16 m. S.W. of Lille, on the La Bassée Canal. A small mining town, it gave its name to an early battle of the First Great War, between British and German forces, and remained for nearly four years a strong point of the German defence system. The town was completely destroyed, but was rebuilt after the war, when it became a flourishing industrial centre with a pop. of 34,000.

The battle of La Bassée was fought in Oct., 1914, during the so-called "race to the Channel ports," when each of the opposing sides was attempting to outflank the other. A British force, under Gen. Smith-Dorrien, began on Oct. 11 a manoeuvre intended to secure Lille, but the Germans

captured that town next day. Three days later the British, after continuous fighting, gained the road from Estaires to La Bassée. By Oct. 17 they had advanced to within $\frac{1}{2}$ m. of the town. On Oct. 20 a determined German frontal attack was launched with the object of piercing the British line. Smith-Dorrien decided that advanced British positions held by the corps on his right could not be maintained, and withdrew his own corps to a new line. Further attacks were beaten back, but the Germans took Neuve Chapelle, Oct. 27. After very severe fighting the British managed to hold a new front between Armentières and La Bassée. Although Smith-Dorrien had suffered heavy losses in the withdrawal, his tactics served to confuse the Germans, and at the time Sir J. French commended his action. Afterwards French declared that the move had imperilled the safety of the whole British army, but later opinion generally confirmed the original verdict.

Labé, Louise (1520–66). French poet, known as La Belle Cordière, (the beautiful rope-maker). Born



Louise Labé,
French poet

at Lyons, the daughter of a rich merchant, she spent an adventurous youth. Disguised as a man and with the assumed name of Captain Loys, she fought at the

siege of Perpignan in 1542. Returning to Lyons, she married a merchant rope-maker, whence her nickname. She is reputed to have been a woman of remarkable gifts, a conversationalist and musician, and acquainted with Greek, Latin, Italian, and Spanish. Her poems, chiefly elegiac and impassioned sonnets, include some of the most beautiful love poems in the world. Her prose *Débat d'Amour et de Folie* was translated into English by R. Greene, 1608. She died April 25, 1566. *Consult Works*, 1877.

Label (old Fr. *label*, *lambel* and *lambeau*, shred). Word used in architecture for the moulding that projects over doors, windows, and similar structures. This is sometimes called a dripstone.

In heraldry a label is a horizontal band with pendant points or wedges. It is used mostly as a mark of cadency for eldest sons,

and for princes and princesses; more rarely as a charge. There may be three or more points, and these may be charged with different symbols, as in the British royal family, these marks being established by warrant under the sovereign's sign manual. (See Cadency.)

Legally, under the Pharmacy and Medicines Act, 1941, articles containing substances recommended as medicines must not be sold by retail or supplied as a sample unless there is written on a label or on the article the name and quantity of the substances



Labiateae. Left, wood sage, *Teucrium scorodonia*; right, hedge woundwort, *Stachys sylvatica*

contained. This does not apply where the article is made up for the use of a particular person, under a prescription. It is an offence under the Food and Drugs Act, 1938, to attach to any food or drug a label which falsely describes it, or is calculated to be misleading.

La Belle Sauvage. Name of a cul-de-sac which formerly lay on the N. side of Ludgate Hill, near Ludgate Circus, London. In 1851 it became the headquarters of the publishing house of Cassell & Co. Here, in the 15th century, was an inn known as Savage's and as The Bell in the Hoop. For long a famous coaching rendezvous, the inn, which in 1676 had about 40 rooms and stabling for 100 horses, was in the 19th century divided into The Bell and The

Belle Savage. Plays were once performed in the inner yard, and here Bankes, the Elizabethan showman, exhibited his horse Marocco. In 1568 the property was bequeathed by John Craythorne to the Cutlers' Company. Grinling Gibbons lived in a house near the outer yard. Before the lease was taken by John Cassell the inn had become a starting-place for omnibuses plying to Richmond. It was destroyed in a German air raid, May, 1941.

Labial (Lat. *labium*, lip). In phonetics, name given to articulations produced chiefly by means of the lips. They include p, b, m, and w. The vowels o, oo, in which the tongue is raised, also require a rounding or contraction of the lips. German ö, u, corresponding to French eu and u respectively, are produced by contracting the lips when the latter are put into position to sound e (as in fête) and (Italian) i (ee in keep). The two sounds represented by f and v are known as labio-dentals.

Labiateae (Lat. *labium*, lip). Large family of herbs and shrubs, natives of all warm and temperate regions. The stems and branches are square in section; the leaves are opposite or in whorls. The flowers have a five-part calyx, and a tubular corolla with five lobes which form two unequal lips to the mouth of the tube. The fruits (varying from one to four) are single-seeded nutlets. Many of these plants have aromatic and stimulant properties, and yield volatile oils, for which they are used in medicine, perfumery, and cookery, e.g. lavender, rosemary, mint, sage, thyme, marjoram, patchouly, and horehound. *See Archangel*; *Nettle*.

Labiche, Eugène (1815–88). French dramatist. Born May 5, 1815, he produced his first drama at the Panthéon Theatre, Paris.



La Belle Sauvage, London. The inner court as it appeared early in the 19th century, with old galleried inn
From an old print

in 1838, and thereafter until 1877 collaborated in nearly a hundred comedies and vaudevilles, e.g. *Le Chapeau de Paille d'Italie*, *Le Voyage de M. Perrichon*, *La Poudre aux Yeux*, *La Cagnotte*. Though light and farcical, his plays are racy in dialogue and rich in comic characters. They were published in 10 vols., 1878-79, and had an immense vogue, with the result that Labiche was elected a member of the Academy in 1880. He died in Paris, Jan. 23, 1888. A study by J. Claretie appeared in 1883. *Pron.* La-beesh.



Eugène Labiche,
French dramatist

Labienus, TITUS (d. 45 B.C.). Roman general. He distinguished himself as one of Julius Caesar's lieutenants in Gaul, but on the outbreak of the civil war deserted him and joined Pompey. He was killed at the battle of Munda, fighting for the younger Pompey.

Lablache, LUIGI (1794-1858). A Franco-Italian singer. He was born in Naples, Dec. 6, 1794, of an Irish mother and a French father, and early developed a remarkable bass-voice. On his public appearance in 1817 at Milan his gifts as a singer were immediately recognized. He went in 1830 to London, sang in Paris, and was regarded as the foremost bass of his time. Lablache was helped by his wonderful dramatic talent, and his public career lasted almost until his death at Naples, Jan. 23, 1858.



Luigi Lablache,
French-Italian singer

Laboratory. Building or room equipped for the carrying out of investigations into some branch of science or industry. Originally it was the workroom of the alchemist, where he sought in vain the philosopher's stone that would transmute base metals into gold. With the development of the science of chemistry, the laboratory came to include rooms in which experiments were carried out and drugs or explosives tested. Whole buildings were put up in which experimental work in all branches of science and engineering was carried out.

Laboratories have features in common for whatever particular science they are designed. They contain wide tables or benches on which apparatus can be placed; gas, electricity, compressed air, and steam points; balances for delicate weighing; steam and electric ovens for drying; good lighting and ventilation. Where chemical tests are likely to be made—even if the laboratory is for geology or biology—solid and liquid chemical reagents will be available. As well as solids and liquids, cylinders of various gases may be used. Where noxious gases are likely, fume cupboards will be provided wherein a forced draught removes harmful vapours before they can penetrate into the main building. The properly equipped laboratory should also possess a range of microscopes of various magnifications.

In physical, mechanical, or engineering laboratories, emphasis is usually placed on the testing of materials or the investigation of the properties of solids, liquids, or gases under varying conditions of temperature, pressure, etc. Here the testing apparatus will be more massive than the mainly glass equipment of the chemical laboratory; even more so where research is directed towards the behaviour of machines and machine components under various conditions.

Many famous laboratories in Europe and America have been endowed by various foundations and turn out perennially research work of the highest standard. See, e.g., Cavendish Laboratory; National Physical Laboratory; Pasteur Institute.

Labori, FERNAND GUSTAVE GASTON (1860-1917). French advocate. Born April 18, 1860, and educated at Reims, he studied law in Paris, England and Germany, and was called to the bar in 1884. His famous cases included the defence of Dreyfus and of Zola on charges connected with the Dreyfus case. On Aug. 14, 1899, before the conclusion of the Dreyfus court-martial, Maître Labori was shot in the back, but recovered enough to resume the defence. He was elected to the chamber of deputies in 1906, and died there suddenly on March 14, 1917, during a secret session.

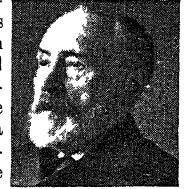
Labouchere, HENRY DUPRÉ (1831-1912). A British politician and journalist. Born in London, Nov. 9, 1831, a nephew of Lord Taunton, he was educated at Eton and Trinity College, Cambridge. He was for a time in the diplomatic

service. In 1865 he entered the house of commons as M.P. for Windsor, but was soon unseated; for a short time he represented Middlesex, but his real parliamentary career covered the years 1880-1906, when he was Radical M.P. for Northampton. In the house he was a remarkably candid critic. He did not spare even the royal family; no reputation, however great, was sacrosanct to him. He favoured economy and radical reforms of all kinds, and was particularly hostile to Cecil Rhodes.

As a journalist he began by acting as correspondent for The Daily News in Paris during the siege of 1870-71. In 1870 he established Truth, and was a fearless critic of sham and humbug. Later he lived in Italy, and died at Florence, Jan. 15, 1912. *Consul Life*, A. L. Thorold, 1913; *Labby*, H. Pearson, new ed. 1946.

Labour (Lat. *labor*, toil). Term for human toil or effort, particularly that which is not undertaken primarily for sport or pleasure, although many kinds of labour can and do give real satisfaction to the labourer. The word is also used to denote workers collectively, especially those employed in non-supervisory grades within factories and in non-clerical occupations. Sometimes labour includes all employees below top managerial level; in this sense, the words personnel and labour are synonymous.

Labour is one of the economist's three factors of production: land, labour, capital. Some economists include a fourth factor, organization, but this is a specialised aspect of labour. The 19th cent. economists distinguished between productive and unproductive labour, the former being labour applied directly to the processes of manufacture. The distinction is still preserved by some accountants, but it is unjustifiable and misleading—the clerk who keeps records contributes to the product as truly as the worker who fashions the material. Classification into direct and indirect labour is preferable. By the division of labour is meant the separation of economic activity into different occupations, and of production into different processes, the individual specialising in one or a few of these.



H. Labouchere
Elliott & Fry

In early communities tedious and distasteful labour was performed by slaves, the more exciting and interesting part, such as hunting and fighting, being retained by the lord. Slavery developed into the serfdom of the feudal system. Serfs had customary hereditary rights and duties in regard to the lord or the holder of certain land, while division of labour had separated them into shepherds, swineherds, blacksmiths, leatherworkers, carpenters, etc., and had produced initiation into a craft through apprenticeship. In towns craftsmen banded themselves together in the guilds to protect their interests. Later specialized craft guilds were formed.

Introduction of Wages

The extreme shortage of labour of all kinds after the Black Death (c. 1348) snapped the stability of serfdom, and employment for wages gradually became the rule. The growth of trade and the increase of capital led in the 15th and 16th centuries to much domestic manufacture for sale at fairs and to itinerant merchants, some of whom supplied materials to be made up by the workers at home; but even then there were a few workshops or factories employing more than a hundred people.

The 18th cent. inventions in connexion with textile manufacture, the application of steam, coal-mining, iron and steel manufacture, etc., made the establishment of factories much more profitable than the employment of domestic workers; while the Enclosure Acts of the 18th century transformed thousands of peasant farmers into landless men, whose children were available to work in the factories. The customary relation between master and man, fundamental to the feudal system, was replaced by a wage contract between the manufacturer, who was generally the factory owner, and the worker.

It was in most cases a harsh contract. "Labour" was treated as a commodity to be bought or sold as cotton or wool or iron might be; and it could be purchased very cheaply, for labour differs essentially from commodities. First, it cannot be stored; today's working hours cannot be sold tomorrow; consequently, the individual worker is in an overwhelmingly weak bargaining position. Secondly, the labour when sold cannot be separated from the labourer, whose health, happiness, and capacity to labour may be affected by his working conditions.

The whole economic system, including the wage contract, was at that time viewed by social thinkers from the market standpoint. It was believed that the individual would best serve the interests of the community only when left quite free to pursue his own interest; he should be free to bargain. Consequently, attempts on the part of workers to combine to strengthen their bargaining power were thought to be against the general interest, and were suppressed. It was not until the middle of the 19th century that most people saw anything wrong in, say, the employment of children of four or five years old in coal mines and cotton mills, or of women and girls to haul coal trucks underground. Gradually the "commodity" view of labour weakened. The first Factory Acts were passed, and the workers became free to form trade unions.

During the last hundred years there has been a growing parliamentary supervision of the employment contract, both to safeguard the health and safety of the workers and to protect those whose bargaining power remained exceptionally weak.

Labour and Management

The development of manufacturing technique and the greatly increased capitalisation of industry have intensified the division of labour. Most factory workers are not craftsmen, but machine operatives, unskilled or semi-skilled; so are many office workers. Again, the ownership of businesses has become separated from management. A few employees usually manage all the others employed in a business. The problem of managing has been and is being studied objectively. Further, the separation of the individual worker from a view of the whole process of production, the aggregation of factory workers in large groups, the growing consciousness of the trade unions, and the spread of education among workers of all grades have combined to create a desire on the part of labour generally to share the direction of industry, and to be consulted by those who manage the business in which they are employed.

Much investigation has been undertaken on the one hand to discover how the most effective use can be made of the labour employed in a business, and on the other hand, to resolve the conflict that continually arises between management and men. The progress in the technique of labour

management, however, has not kept pace with that in the technique of the management of machines and materials, despite the vast apparatus of negotiating and consultative committees that has been established. *See Management; Joint Industrial Councils; Trade Union; Wages.*

H. Watson

Bibliography. Six Centuries of Work and Wages, J. E. T. Rogers, 1894; Human Problems of an Industrial Civilization, Elton Mayo, 1933; Leadership in a Free Society, T. N. Whitehead, 1937; Economics, F. Benham, 1938; Managerial Revolution, James Burnham, 1941; Industrial Relations Handbook, H.M.S.O., 1944; Personnel Management, C. H. Northcott, 1945.

Labour, KNIGHTS OF. This organization is described under Knights of Labour.

Labour and National Service, MINISTRY OF. Department of the British government. Set up in 1916 as the ministry of Labour, it became responsible for national business affecting employment of labour, including industrial arbitration, employment exchanges, etc. The special areas commissions set up in 1934 were under its control. During the Second Great War the ministry took over the organization of manpower, including registration for military service. Its name was changed to its present form in Dec., 1939, in view of the wider scope of the ministry. Its chief London office is in St. James's Square, S.W.1.

Labour Day. Day set apart in many countries for organized demonstrations and celebrations by the labour movement and working classes. In Europe it is generally held on May 1, but the reason for selecting that date is obscure. By some fanciful writers it is identified with the old May Day festivity; a more probable connexion is that on May 1, 1889, the Second Socialist International meeting in Paris proposed international working class celebrations. Attempts to make May 1 a labour holiday on the Continent have led to riots and bloodshed. May Day is an official holiday in Soviet Russia. In Great Britain Labour Day is held on the first Sunday after May 1. From 1892 there has been a London meeting in Hyde Park. In Australia, Labour Day is known as Eight Hours Day and is a public holiday observed in the different states according to the date on which their legislatures made compulsory a working day not exceeding eight hours.

In Canada also Labour Day is a public holiday.

In the U.S.A. Labour Day is a public holiday on the first Monday in Sept. It started in the west in 1882, and had been adopted by several states when congress in 1894 made it a legal holiday in all. Originating in a desire to do honour to labour and promote the interests of manual workers, it has come virtually to correspond to an English bank holiday as an occasion for people of all classes to refresh themselves.

Labourdonnaïs. BERTRAND FRANÇOIS, COMTE MAHÉ DE (1699-1753). French sailor. Born at St. Malo, Feb. 11, 1699, he entered the French East India Company in 1718, and rose rapidly to the command of a vessel. In recognition of his gallantry in the capture



Count de Labourdonnais, French sailor

of Mahé, Malabar, 1724, he was given permission to take the name of that town, and after several years fighting in the Indies, in 1735 was appointed governor of the Îles de France and de Bourbon. He again distinguished himself in the war with Great Britain, 1740-48, but quarrelled with Duplex. After two years in the Bastille, 1749-51, he was tried for maladministration, but acquitted. Died Nov. 10, 1753.

Labourer. Term for one who for wages works with his hands, especially work of a kind calling for bodily exertion, but little skill or training. With artisans and mechanics, from whom they differ in not being skilled craftsmen in some particular manufacturing process, and with certain other specified sections of the community, labourers are comprehended in the working class within the meaning of the Housing Act, 1936. See Agricultural Labourer.

Labourers, STATUTES OF. Name given specifically to acts passed in the reign of Edward III to regulate the rate of wages. The Black Death of 1348 caused an extreme scarcity of labour, and the acts, the first of which was passed in 1349, were designed to protect the community at large against exploitation of its necessities by any single section. Able-bodied labourers, bond or free, were required, under pain of imprisonment, to work at the wages prevalent before the plague, and employers who offered or paid

more than the current rates were liable to be mulcted in three times the amount. The statutes, amended and extended, empowered justices of the peace to determine labour matters in dispute and to fix wages. The statutes were repealed as obsolete in 1863. See Labour; Wages.

Labour Exchange. Name by which an employment exchange was known, 1910-16. In the latter year labour exchanges came under the newly established ministry of Labour, and the name was changed accordingly. See Employment Exchange.

Labour Party. British political party. During the second half of the 19th cent. the Liberal party began to adopt trade unionists as parliamentary candidates in industrial constituencies. From 1880 onwards a number of groups, of which the Fabian society (*q.v.*) was the most prominent, advocated a comprehensive policy of socialism, including the nationalisation of the means of production and distribution. These groups derived their inspiration partly from earlier experiments in Christian socialism in England, and partly from Continental groups with similar objectives, deriving their policy ultimately from Marx and Engels. From these various groups the Independent Labour party (*q.v.*) was formed in 1893; its secretary and guiding spirit, James Keir Hardie, returned to parliament in 1892, was its first and for long its only representative in the House of Commons.

The establishment of the Labour representation committee in 1900, however, marks the real beginning of the parliamentary Labour party, which secured 26 seats at the general election of 1906. The decisive change in its status came with the inclusion of a Labour member, Arthur Henderson, in the coalition cabinet of 1915; and at the general election of Nov., 1918, the party won 59 seats; and at that of 1922, 143, against 117 by Liberals of all groups, thus becoming the chief alternative party to the Conservatives. At the election of Nov., 1923, 191 Labour candidates were successful. The Conservative prime minister, Baldwin, resigned, and the first Labour govt., with J. R. MacDonald as prime minister, took office at the beginning of 1924, with limited Liberal support, lost in Oct., whereupon the govt. resigned. At the election of 1929, Labour returned 287 members, against 261 Conservatives and 59 Liberals.

MacDonald formed his second minority Labour govt. In the financial crisis of 1931, MacDonald became in Aug. prime minister of a national govt. in which Conservatives, Liberals, and a few other Labour members joined. At the general election which followed in Oct., MacDonald's followers, National Labour, secured 13 seats: Labour party representation was reduced to 52. Its strength rose to 154 in 1935. On the fall of Chamberlain in 1940, the party gave its full support to Churchill and a number of Labour leaders accepted office. At the general election of July, 1945, the Labour party, resuming freedom of action, was swept to power with 392 seats, a majority of 178 over all others.

With C. R. Attlee as prime minister and E. Bevin as foreign secretary, the first Labour govt. in power as well as in office put into operation a policy of increased social services and the nationalisation of the Bank of England, coal, gas, and electricity, transport, and the steel industry. Its foreign policy supported the U.N. and encouraged Western Union; it also rapidly granted independence to India, Ceylon, and Burma. In the 1945-50 parliament the Labour party lost no seat in by-elections, but in the 1950 general election it secured only 315 seats, with a majority over all other parties of six. Consult A History of the Labour Party from 1914, G. D. H. Cole, 1948; Fifty Years' March, F. Williams, 1949.

Labrador. Canadian territory lying north of the Gulf of the St. Lawrence between Hudson Bay and the Atlantic. It was divided between Canada and Newfoundland, and the area of the whole is about 510,000 sq. m. The disputed boundary line between the Canadian and the Newfoundland jurisdictions was referred for decision to the judicial committee of the privy council. In 1927 this decided in favour of the latter, to whom 110,000 sq. m. of territory in Labrador were allotted.

The length of Labrador, from the Strait of Belle Isle in the S. to Cape Chidley on Hudson Strait in the N., is about 1,000 m. A range of mountains runs along it; in the S. these are not lofty, but in the N. are peaks rising to 5,000 ft. or more. On Hamilton River, near Lake Melville, is Goose Bay airport, on the N. Atlantic ferry route of the Second Great War.

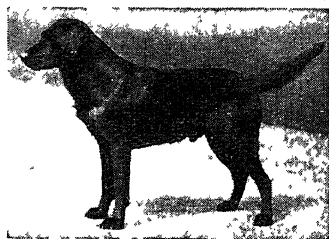
The climate is raw, and fishing, especially for cod, is the only industry. Whatever may be

possible in the way of mining development in the interior, where iron ore deposits occur, the coastline, bare, rugged, and chilly, can never be productive. The population numbers about 5,000. Battle Harbour is the capital. The territory was British from 1763. The name comes from a Portuguese word meaning farmer. *Consult* Labrador, W. G. Gosling, 1910; W. T. Grenfell, 1922.

Labrador Current. A cold stream originating in the Arctic and flowing into the Atlantic between the Gulf Stream (q.v.) and the coast of N. America. It carries into the Atlantic the icebergs which menace shipping and is responsible for the heavy fogs off the coast of Newfoundland: the air from warmer parts of the ocean blows over the icy Labrador current, becomes chilled, and so its moisture condenses. Because of the current, the ports of Labrador remain ice-blocked until mid-summer.

Labradorite. One of the feldspar group of minerals, consisting of an isomorphous mixture of soda-feldspar (albite) and a larger percentage of lime-feldspar (anorthite). Labradorite forms triclinic crystals, usually grey, but often showing green and blue iridescence, which gives the stone ornamental value when polished. It occurs as a primary constituent in basic igneous rocks such as basalt, dolerite, norite, and gabbro.

Labrador Retriever. Sporting dog used to retrieve game. It is a sturdy, strongly-built, and very



Labrador Retriever. Pedigree specimen of this highly intelligent and companionable sporting dog

active animal. The coat, generally black, though other self colours are sometimes seen, is close, short, dense, glossy, and devoid of wave. The tail, another distinctive feature, is of medium length, thick at the base, gradually tapering towards the tip, clothed thickly with short, dense hair like the coat, and virtually free from feathering, giving that peculiar rounded appearance described as the "otter tail." The eyes, which may be brown, yellow, or black, express

great intelligence and good temper, and the dog is trustworthy and companionable.

Labrador Tea (*Ledum palustre*). Shrub of the family Ericaceae. It is a native of N. America and the Arctic. With slender, alternate leaves, the margins curled under, and the lower surface clothed with rusty wool, it is fragrant when bruised. The small white flowers are clustered in umbels. The leaves are reputed to be a good substitute for tea.

La Bruyère, JEAN DE (1645-96). French writer. Born in Paris Aug. 16, 1645, he was educated at



Jean de la Bruyère, French writer

an Oratorian establishment. After holding a fiscal appointment at Caen, he became tutor in 1684 to one of the Condé family, whose patronage he retained throughout his life. A friend of Bossuet and other distinguished men, La Bruyère was elected a member of the Académie Française in 1693, and died suddenly at Versailles, May 10, 1696.

He is best known by *Caractères*, 1688, which went through several editions before his death. The work consists of a medley of character studies and reflections on the personalities and morality of his times, and owes its place as a classic of 17th century French prose to its clear incisive style and shrewd observation. His *Dialogues sur le Quétisme*, a theological discussion, appeared posthumously in 1698. There are studies by M. Pellisson, 1896, and P. Morillot, 1904.

Labuan (Malay, anchorage). An island off the N.W. coast of Borneo. Since 1946 a crown colony attached to British North Borneo, it is about 40 m. N.N.E. of Brunei, the capital of the state of that name, and 725 m. E.N.E. of Singapore. The area is 35 sq. m. It has a fine port, Victoria Harbour, and facilities for coasting steamers. The surface of the island is hilly and the soil fertile, with about 2,000 acres under cultivation. Cattle and goats are reared, and there are sago factories. Labuan is rich in coal, but the coalfields, of which much was ex-



Labuan arms

pected, proved disappointing and were closed after 1910.

The pop., est. 8,963, are mostly Malays, natives from Brunei, and Chinese traders. There are cables to Singapore, Hong Kong, and North Borneo. A settlement was made on Labuan by the servants of the East India Company who were expelled from Balambangan in 1775, but it was later abandoned. Labuan was ceded to Great Britain in 1846 by the sultan of Brunei. In 1889 it was brought into North Borneo, in 1907 annexed to the Straits Settlements, and in 1912 made a separate settlement. Occupied by the Japanese in Jan., 1942, after the withdrawal of the British forces, Labuan was liberated by the Australian 9th division on June 10, 1945. The Japanese in British N. Borneo surrendered here Sept. 10.

Laburnum (*Laburnum vulgare*). Hardy flowering tree of the family order Leguminosae. A native of



Laburnum. Flower sprays and foliage

central and southern Europe, it was introduced into England before 1597. It flourishes in any ordinary soil in a sunny position, and its long racemes of yellow flowers are familiar objects in late spring in many gardens. The laburnum, which may be planted in the autumn, is raised from seed sown in March. The seeds are highly poisonous.

Labyrinth. In Greco-Roman times, a confusing network of paths or passages, generally underground, purposely designed so as to make it difficult for anyone who entered to get out again. The most famous labyrinths of ancient times were the Egyptian, described by Herodotus, situated near Lake Moeris, and constructed about 2,300 B.C.; the site has been excavated and the foundation exposed by Petrie. Another was the Cretan, built, according to legend, by the inventor Daedalus, at the instance of King Minos, in order to keep under control the monster known as the Minotaur. Excavations on the supposed site have not revealed anything which

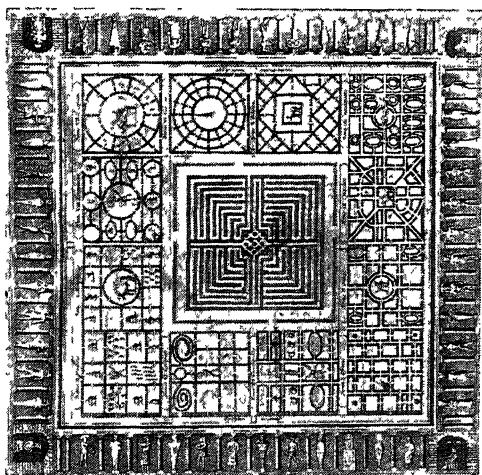
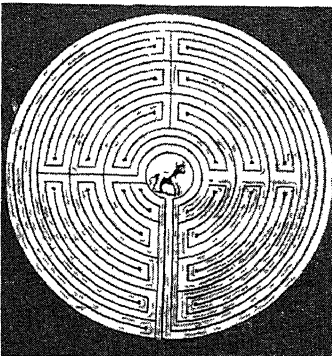
can be indubitably identified with the Cretan labyrinth. A third was the Italian at Clusium. The modern counterpart of the labyrinth is the maze, such as that at Hampton Court. See Maze.

Labyrinthodonts (Gr. *labyrinthos*, labyrinth; *odous*, tooth). Name given by Professor Owen to certain extinct amphibians found in the rocks of the Carboniferous, Permian, and Triassic age. So named from the curious labyrinthine structure of their teeth, they resembled salamanders or newts in appearance. See Stegocephali.

Lac. Variant spelling of lakh (q.v.), Hindu for 100,000.

Lac. Name given to the insect Laccifer (*Tachardia*), one of the

females, die. The females excrete resin in larger quantities and the ovaries become filled with a red



Labyrinth. Facsimiles of old prints illustrating the labyrinth near Lake Moeris, Egypt, and (top right) the circular labyrinth of Daedalus in Crete

Coccidae, which produces lac resin and lac dye. The insect is cultivated in India, where more than 90 p.c. of lac resin is produced. The dye has ceased to be important, though originally it was the more valuable product. The name lac is derived from Hindu *lakh*, =100,000 and in old Sanskrit manuscripts the tree *Butea frondosa* is called *Lakhshatru*, i.e. the tree which nourishes 100,000 insects. The lac insect breeds on over 90 species of trees, but only seven are important, chiefly *Schleichera trijuga* (the kusum tree), *Zizyphus jujuba* (the wild plum), and *Butea frondosa* (the palas tree).

The swarm of insects settles on the twigs and, thrusting their heads into the bark, the insects begin to feed, excreting a small amount of resin which forms a protective dome over the insect. After eight to ten weeks the males emerge and, having fertilised the

fluid in which the eggs form. The new brood emerges about a month later and the mother insect dies.

LAC RESIN. The resinous cells form a thick, hard incrustation on the twigs. This is collected and separated from the wood, then macerated in water which dissolves the dye and removes wood and other impurities. The dried resin is in the form of granules known as seed lac. Shellac is made by fusing the seed lac in a tubular twill bag 20-30 ft. long before a fire. The molten resin is forced through the cloth by twisting the bag. The plastic mass exuded is stretched into thin sheets and, when cold, broken up. Button lac is made by stamping the resin into flat plates. Stick lac is the name given to the resin while it is still attached to the twigs. India's output of lac resin, about 30,000 tons a year, is valued at about £2,000,000.

LAC DYE. Used from early times, referred to c. A.D. 250, this was imported into England by 1790. A pigment was produced from it by precipitating the alkaline solution of the dye with alum; a recipe on these lines is given in a 17th century MS., probably typical of processes used much earlier. The dye is closely related in chemical constitution to that produced by the cochineal insect of a similar colour. See Cochineal; Dye; Resin; Shellac.

T. Hedley Barry

La Calprenède, GAUTIER DE COSTRES DE (c. 1610-63). French writer. Born of good family near Sarlat, Dordogne, he was educated at Toulouse and later received a military appointment at the court. There he gained a great reputation among his contemporaries by his long pseudo-historical romances, *Cassandre*, 1642 (Eng. trans. 1667); *Cléopâtre*, 1647 (Eng. trans. 1687), and *Faramond*, 1661. They are, however, prolix and tedious to the modern reader, and his plays, e.g. *Le Comte d'Essex*, 1639, have also little but historical interest. He died at Grand Andelys as the result of a horse's kick.

Lacandon. American Indian tribe of Maya stock and speech in N.W. Guatemala and E. Chiapas, Mexico. Widespread at the time of the Spanish conquest, they are now rapidly dwindling.

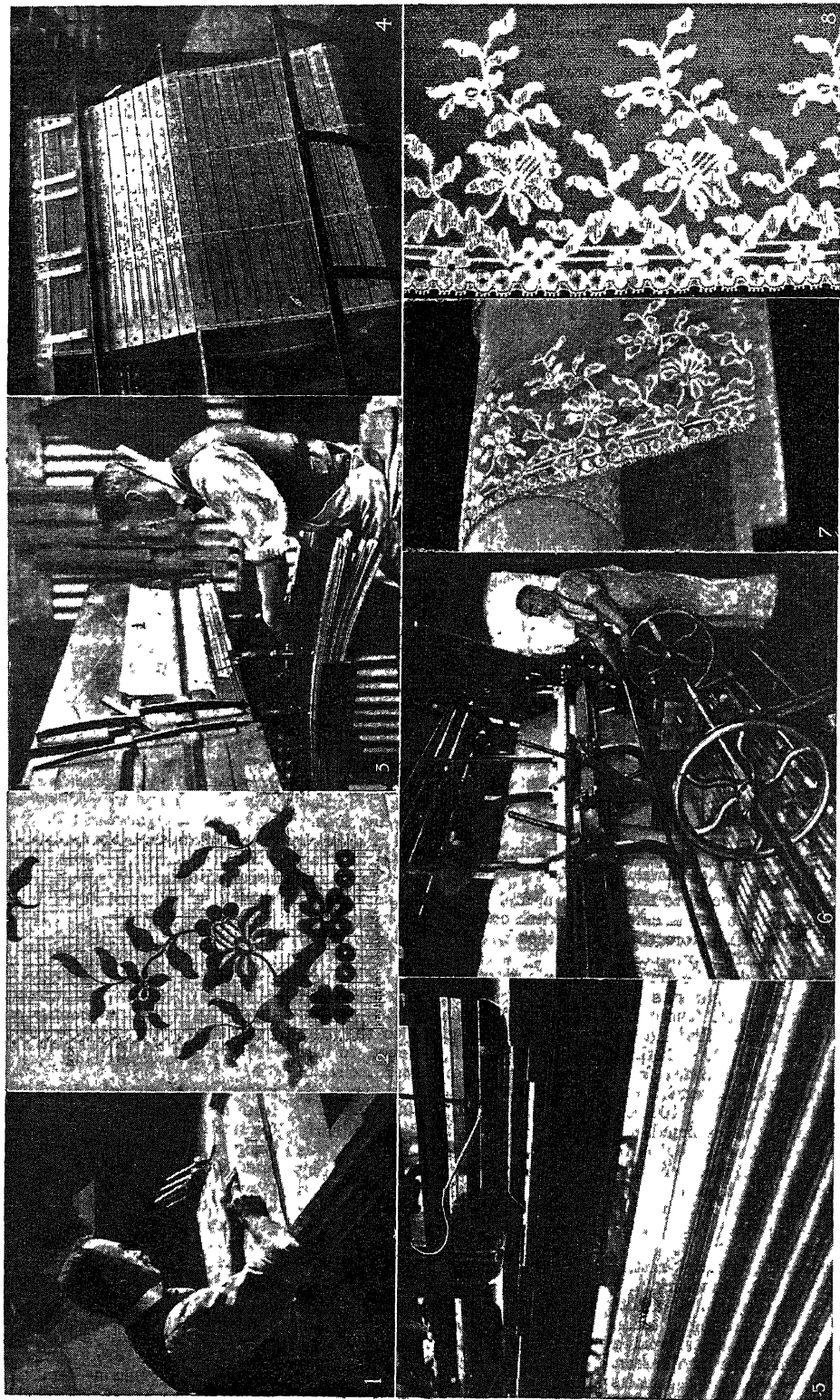
Laccadive. Group of low coral islands in the Indian Ocean. Belonging to the Indian Union, they are administered from Madras and lie 170 m. W. of the Malabar coast. The five Amindivi islands form the N. group, the S. group includes the isolated island of Minicoy. They are covered with coconut plantations; food grains are cultivated in excavations below the surface coral. Trade, chiefly in coir, is carried on by native sailing boats to the mainland. Most of the people are Mahomedan Mahpillas. Only nine of the 14 islands are inhabited. They were discovered by Vasco da Gama in 1499. Their area is 80 sq. m. Pop. 15,230.

Laccolith OR LACCOLITE (Gr. *laccos*, cistern; *lithos*, stone). Intrusion of igneous rock which,



Laccolith. Diagram showing the way in which the igneous intrusion is emplaced by the up-arching of the overlying strata

rather than spread laterally to form a flat sheet, has made room for itself by up-arching the overlying strata. Roughly oval, it must have been fed by a dyke or pipe feeder from below. The up-arching of the beds by hydrostatic pressure of the intrusion probably produced a dome of elevation on the original surface, but this has rarely been demonstrated, because erosion has usually stripped away the surrounding rocks. Laccoliths were first identified in the Henry Mts., Utah, in 1877. Examples of this phenomenon from many countries have been described.



1. Draughtsman working on design. 2. Pattern sheet, with design drawn on numbered squares. 3. Punching long cards, seen laced together in 4, with holes corresponding to the design on the numbered squares of pattern sheet. 4. Laced long cards, seen laced together in 4, with holes corresponding to the design shown in 2. 5. Lace machine, with cotton unwinding from long spindles. 6. Loom at work making lace according to the design shown in 2. 7. Enlarged view of portion of a beam winding lace as it is woven. 8. Finished lace

LACE : PROCESSES IN THE MANUFACTURE OF LACE FROM ORIGINAL DESIGN TO MACHINE-MADE PRODUCT

LACE: HAND MADE AND MACHINE MADE

* F. V. DAVIES, A.R.I.C., Textile Chemist

This article deals with the two main varieties of lace. See the articles on associated industries, e.g. Bleaching; Dyeing; Weaving. See also Nottingham

Lace in the strict sense of the word, is an arrangement of twisted threads, and the simplest of all forms is seen in the shoe lace or corset lace. Such laces are by custom regarded as separate from the more or less decorative laces used in apparel and in furnishings, but the original connexion should not escape remark. In these days ornamental laces are made in many materials; preponderantly in cotton, but also in silk, linen, worsted, artificial silk, and metallic threads. They are divided into real or hand-made, and mechanical or machine-made, and naturally the former is much more valuable if only for the large amount of labour required in its production. The machine-made laces repeat all, or very nearly all, the features of hand-made, but are recognizable both by their relative cheapness and their greater regularity of pattern. The small irregularities which lend individuality to real lace are absent in machine lace.

Needle and Pillow Lace

Two main methods of making lace by hand demand notice: (1) needle or point, and (2) pillow lace. The first approaches embroidery in nature and is worked with the needle upon a foundation of fabric; the second requires the aid of a pillow or pad, into which pins are pressed in such a pattern as will form the design, and threads, contained on separate small bobbins, are twisted or plaited around the pins and each other. The methods produce characteristic results; effects are obtainable, therefore, by the one which cannot be achieved by the other.

Point lace was made in Venice in the 15th-16th centuries, and the beautiful designs then originated are perpetuated in hand and machine-made laces today. The beautiful rose point, in which tiny roses stand out in relief almost as though they had been chiselled, is the most characteristic of Venetian products. The fabric upon which the figures are worked is carefully cut away and modern mechanical adaptations of the same principle of working provide some of the most ornate and beautiful of modern machine laces.

Bobbin laces were known to the Egyptians, and specimens are preserved in museums. This early lace was a geometrical network

made upon a vertical frame by plaiting. Use of the lace pillow came about in the course of gradual improvement through the centuries. Bobbin lace was made in Venice and also in Flanders, and the art of making pillow lace by hand in England appears to have been introduced by Flemish refugees. The names of several of these laces—Brussels, Mechlin, Valenciennes—indicate their origin.

Traditional Patterns

Hand lace making is still a village industry, notably in Bucks, Beds, Northants, and Devon. Designs of 300 years ago in these counties are produced in equal beauty today. The patterns of different districts, even villages, are distinct, bearing their traditional and often romantic names.

Study of hand-made laces is facilitated by recognizing first the groundwork between the ornament of the pattern. In the Lille ground, there is a mesh, hexagonal in shape, formed by twisting two threads round each other. In Mechlin ground the hexagon has four sides formed by twisting and two by plaiting. The traditional Lille designs are more formal than Mechlin designs, which are of a floral or scroll character. Northants laces mostly show the Lille influence, whereas Bucks laces show both. Bedford laces have come under more modern influences. Honiton lace has a rich and easily identifiable quality of its own, attributable to the Brussels lace workers who settled there. Bucks point lace is regarded as the most delicate and beautiful of English laces; the Buckinghamshire carnation, tulip, acorn, and bell patterns are well known.

Artistic influences other than Flemish have influenced English lace designs, notably Maltese. Hand-made laces are imported from Malta more cheaply than they can be made in Great Britain, but lace of Maltese character is made in Beds. The names of some of these laces are suggestive of their style, e.g. Cluny lace of Italian pattern, deriving its name from the Cluny Museum, Paris, and Torchon, a relatively coarse lace, are both made by hand in England, although an immensely greater quantity is turned out by machine in the Nottingham district. Guipure lace, made without any

ground of plain net and raised work, or cordonnnet, as in Honiton patterns, is also produced by both hand and machine work. A word is due about the beautiful Irish laces, Limerick, worked with the needle on machine-made net, and Irish crochet, produced wholly by one needle. Carrickmacross is also of the nature of an embroidery.

The commercial importance of hand-made lace is infinitesimal, but it has great artistic value. The hand-made article showed the way to producers of mechanical lace and suggested the designs to be followed. The highest praise that can be given to a lace-making machine is that it is capable of producing any pattern that can be made by hand.

The first mechanical laces produced in England were made upon an adapted knitting frame in 1764. In knitting, a connected fabric is formed by the looping of thread; and by warp-knitting, in which a vertical set of threads is combined by means of other threads controlled by needles, a pattern is produced which does not unravel.

The Coming of Machinery

A great step forward was taken when Heathcoat perfected in 1809 his bobbin-net machine upon which plain hexagonal net could be made. Plain net produced upon the same principle is manufactured in immense quantities today. Fine or Bretonne hexagonal net is made for millinery, for dresses, and also to serve as a basis for embroidery and fancy laces. Quantities are turned out as protection against mosquitoes. *Point d'esprit* nets have a polka dot, or sprig, at regular intervals, and there are also fancy nets with floral or geometrical and openwork patterns.

It was an invention in 1813 that laid the foundations of the modern lace manufacturing industry. Leavers, a Nottingham mechanic, devised a machine with provision for a set of vertical threads, having a bar carrying thread wound upon small bobbins, and enabling these bobbin threads to be moved a certain distance from side to side in such a manner that a pattern could be formed by twisting the one set around the other. This machine in its perfect form allows of the production of any pattern, and the complexity of the apparatus can be judged from the fact that a machine carries some 5,000 little brass bobbins each holding about 100 yards of the yarn used in making the laces. Control of the pattern is secured by an adaptation of the Jacquard loom (*q.v.*) principle.

Valenciennes, Torchon, Malines, Alençons and Guipures are merely some of the kinds of lace produced upon Nottingham machines. Laces are made for all purposes, and perhaps the largest consumption is as trimmings for articles of underclothing. Window curtains are commonly made upon a Nottingham machine which is an adaptation of the Leavers.

The future of the industry does not depend upon fancy or artistic laces alone, for strides have been made in the production of plain fabrics. Cellular cotton underclothing is essentially a lace fabric. Tulle as used for millinery and evening dresses is a lace net. Lace peculiarly depends upon the artistic merits of the designs, and necessarily a preponderance of them are floral and conventionalised from plant forms. The study of lace design engages much attention, and it can best be pursued by close attention to such classical models as are shown in the great museums, and in such art schools as that of Nottingham.

When lace has been manufactured by machine there remain delicate operations to perform in mending imperfections, bleaching the article to a pure white, dyeing it in case of need, and dressing it with the agents required to lend the desired degree of stiffness, smoothness, or silkiness. The operations are highly skilled, engaging specialists and forming a separate industry. The industry is subdivided, and in Nottingham a whole family of trades has grown up around lace-making, including those who make the machines, those who make net, lace, and curtains, finishers of lace goods, exporters, merchants, and agents.

Bibliography. History of Machine-wrought Hosiery and Lace Manufacture, W. Felkin, 1867; History of Hand-made Lace, F. N. Jackson, 1900; History of Lace, F. Bury Palliser, 4th ed. 1902; The Lace Book, A. Hudson Moore, 1905; Seven Centuries of Lace, Mrs. J. H. Pollen, 1908; The Lace Book, J. F. Caplin, 1932.

Lace-bark Tree (*Lagetta linearia*). A tree belonging to the family Thymelaeaceae. A native of Jamaica, it has oval leaves and white tubular flowers. Its chief interest lies in the inner bark, consisting largely of concentric layers of interlacing fibres. By beating and maceration, these layers may



Lace-bark Tree. Foliage and flower sprays

be separated and taken from the wood in considerable lengths, when their appearance is remarkably like that of a beautiful manufactured lace. Many articles of dress are contrived of this durable material, of which a collection may be seen in the museum at Kew.

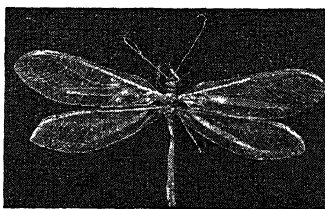
Lacedaemon (Gr. *Lakedaimōn*). In ancient Greece, an alternative name for Laconia, the district of the Eurotas valley in S. Peloponnesus, and also for its capital, Sparta. Part of the district forms the nomos or province of Lacedaemon in the modern kingdom.

La Ceiba. Town on the coast of Honduras. On the rly. which serves the banana territory, it exports fruit and hides. There are daily air services. Pop. 16,152.

Lacerta (Lat., lizard). A small constellation whose stars were grouped together by Hevelius. It is between Cygnus and Andromeda.

Lacertilia. Latin name given to the lizards as distinguished from snakes. See Lizard.

Lace-wing Fly. Insect of the families *Chrysopidae* (green lacewings) and *Hemeroptidae* (brown



Lace-wing Fly. Specimen with delicate wings fully extended

lace-wings) both of the order Neuroptera (q.v.). They possess four subequal glassy and closely net-veined wings; slender bodies and antennae; and brilliantly metallic eyes. Their larvae roam over vegetation, preying chiefly upon aphides, and are therefore beneficial. Lace-wings are the most abundant of all Neuroptera, with over 40 British species. Consult British Neuroptera, F. J. Killington, 1936-37.

La Chaise, François (1624-1709). French Jesuit. The son of Georges d'Aix, lord of La Chaise, he was born at Aix, Aug. 25, 1624. Educated at the university of Lyons, he entered the Society of

Jesus, and soon made a reputation as a lecturer. He is chiefly known, however, as the confessor of Louis XIV, and as the man who gave his name to the cemetery of Père-Lachaise (q.v.) in Paris. He became the king's confessor in 1674, and retained the post until his death, Jan. 20, 1709. La Chaise, who founded the college of Clermont, is regarded as having been less bigoted than many of his contemporaries e.g. in his attitude towards the Jansenists.

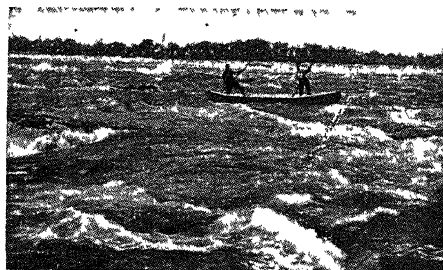
La Chaussée, Pierre Claude Nivelles de (1692-1754). French dramatist. Born in Paris, he became known as a writer of extremely sentimental plays, which enjoyed considerable popularity. The most successful were *Le Préjugé à la Mode*, 1735; *Mélanide*, 1741; and *L'École des Mères*, 1744. These pieces have some importance in the development of the French drama, as being the first examples of the *comédie larmoyante*, or tearful comedy, which marked a stage in the evolution of the modern social drama from the classic models of the early 18th century. La Chaussée died May 14, 1754, and his collected works were published 1777-78.

Laches (Lat. *laxus*, loose, slack). Old Norman term used in English law to signify laziness or lack of promptitude in pursuing a legal remedy. Where the plaintiff is endeavouring to enforce a right in equity, as distinct from the common law, e.g. an injunction, the court will refuse to grant him his remedy where he has slept upon his rights. The maxim *vigilantibus, non dormientibus, aequitas subvenit* applies—equity helps the wakeful, not the slumbering.

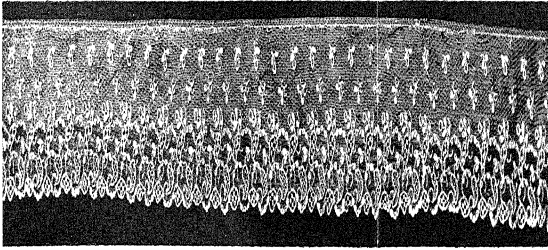
Lachine. A town of Quebec, Canada. It stands on Lake St. Louis, a widening of the St. Lawrence,



François de La Chaise, French Jesuit



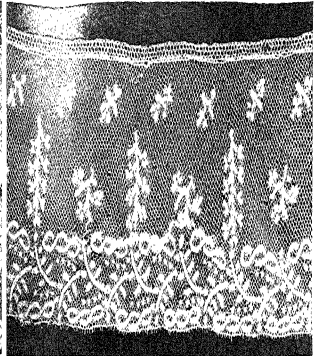
Lachine, Quebec. The rapids on the St. Lawrence River



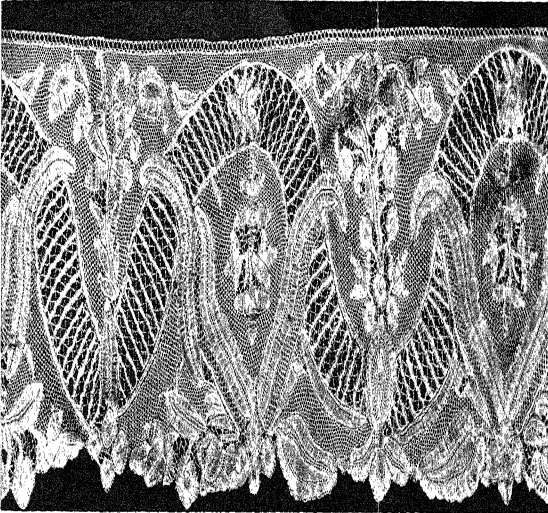
Point d'Aleçon, taking its name from the town of Aleçon and belonging to the period of Louis XVI



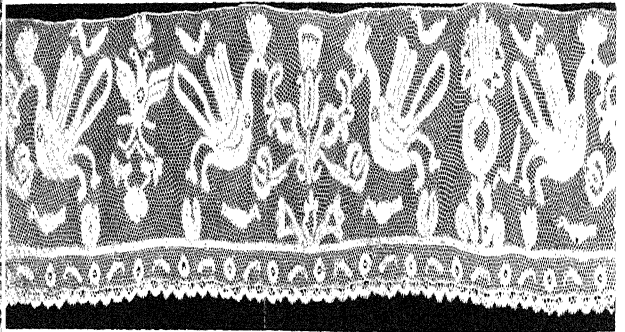
Point de France, period of Louis XIV, a forerunner of many machine-made laces



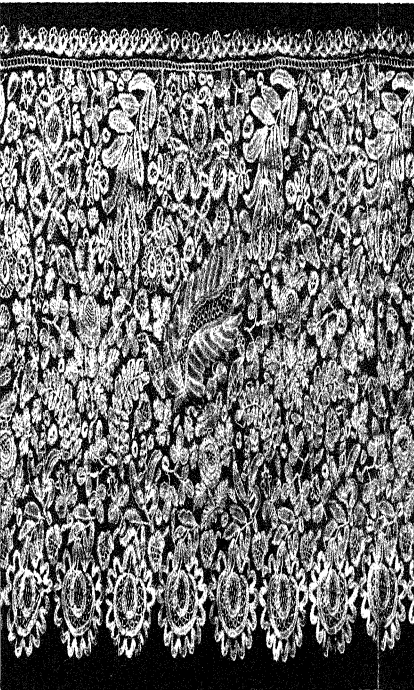
Valenciennes, one of the types most largely copied by machinery



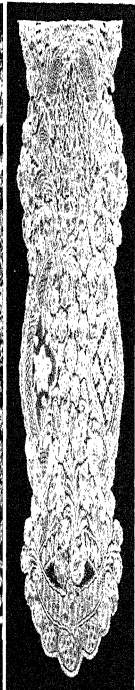
Flemish, period of Louis XV, hand-made by the aid of the lace-worker's pillow, pins, and bobbins



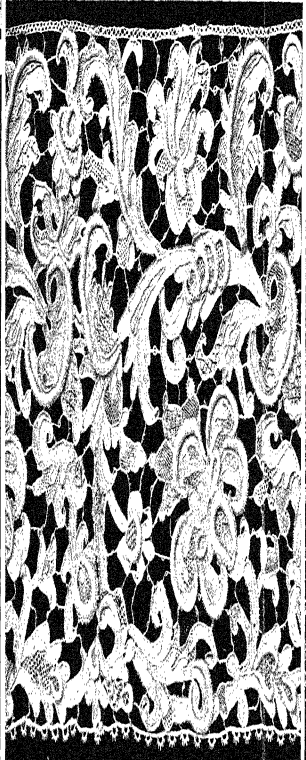
Italian pillow lace of the early 18th century. Vilest laces of this style have been machine-copied extensively



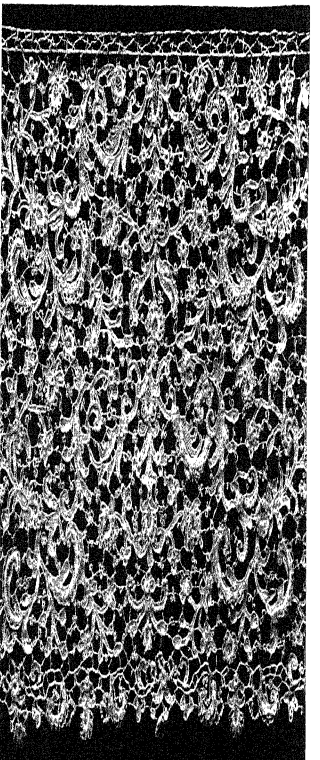
Characteristic Devonshire pattern produced in Devonshire, notable for its well-defined outlines



Brussels, point d'angleterre



Spanish point, made in Venice, typical of a large family of 17th century styles



Venetian rose point, 17th century, a favourite and much copied lace

LACE: DELICATE FABRICS OF FINEST THREAD AND EXQUISITE DESIGN, EXEMPLIFYING ONE OF THE MOST ENDURING OF THE ANCIENT ARTISTIC HANDICRAFTS

to the S. of Montreal, of which city it is virtually a suburb. With stations on the C.N.R. and C.P.R., it stands at the head of a canal to Montreal, built to avoid the Lachine rapids in the St. Lawrence, and from here steamers go to Montreal, Ottawa, and elsewhere. An electric rly. connects with Montreal. The industries include engineering works and the manufacture of wire rope. The name La Chine (China) was given because the French explorer, De la Salle, thought it was on the way to that country. Pop. 19,898.

Lachish. An ancient fortified town of Palestine, 16 m. E. of Gaza. Petrie's excavations at Tell el-Hesi in 1890, with his dating of pottery and implements, inaugurated Palestine archaeology. In 1891-93 Bliss completed the revelation of this Mound of Many Cities (1700-400 B.C.). A cuneiform tablet of 1400 B.C. belongs to the Tell el-Amarna correspondence. Successive levels are identifiable with Joshua, Rehoboam, Sennacherib, and Nebuchadnezzar. Sennacherib's siege (701 B.C.) is depicted on Assyrian bas-reliefs in the British Museum. During 1933-39 the Wellcome-Marston expedition carried out further excavations at Lachish and uncovered quantities of pottery, utensils, and inscribed tablets. The tablets, inscribed in 587 B.C. and the earliest writings discovered in Palestine, identify over 20 personal names mentioned in the Bible. Skeletons found in a burial chamber proved that Assyrian surgeons of that period were capable of trepanning operations. See Clay Tablets; Palestine.

Lachlan or **CALARE.** River of New South Wales, Australia. It rises in the Cullarin range, 120 m. S.W. of Sydney, and flows W. to join the Murrumbidgee, about 55 m. above its junction with the Murray. The upper and middle parts of its basin produce wheat and fruit, the lower part of its 850-m. course is pastoral. Lake Cowal is maintained by the Lachlan floods, which take off by a distributary, 20 m. long, to reach the lake, which, in turn, ultimately drains into the Lachlan, 40 m. farther down stream.

Lachmann, KARL KONRAD FRIEDRICH WILHELM (1793-1851). A German critic and philologist. Born at Brunswick, March 4, 1793, he became professor at Königsberg (Kaliningrad) and from 1825 at Berlin, where he died, March 13, 1851. As a textual critic, it was his great merit that instead of simply

emending conjecturally the existing texts of classical authors, he carefully weighed and sifted the MS. tradition and endeavoured to reconstruct the text, his most successful efforts being editions of Lucretius and of the Greek N.T. Applying the same principle to old Germanic literature, he edited the Nibelungenlied, which, like the Iliad of Homer, according to the theory advanced in his essay on that poem, he regarded as consisting of a number of originally independent lays; and the poems of Walther von der Vogelweide and Wolfram von Eschenbach.

Lachrymal Gland. Small gland placed in a hollow in the upper and outer part of the orbit or bony structure which surrounds the eye. It opens by 12 or 14 fine ducts on the inner surface of the upper eyelid. The function of the lachrymal gland is to secrete a watery fluid which is swept across the eyeball by the movements of the lids, and keeps the surface of the conjunctiva clean and moist. This fluid passes out through two minute openings, the puncta lachrymalia, situated on the margins of the upper and lower eyelids near the internal angle. These lead the secretion to the nasal duct, down which it passes to the lower posterior part of the nose. When excessive secretion of the lachrymal gland occurs, the puncta are insufficient to carry away all the fluid, which then overflows the eyelid in the form of tears.

Epiphora is a condition in which there is a persistent overflow of tears. This may be due to malposition of the lower punctum, but is more frequently due to stricture or blocking of the nasal duct, following chronic catarrh of the mucous membrane, local injury, local infection with inflammation, or disease of the bone. The condition can often be remedied by passing a probe through the obstructed duct. See Eye.

Lachute. A town of Quebec, Canada. It stands on North river, 44 m. W. of Montreal, and 76 m. E. of Ottawa, with stations on the C.P.R. and C.N.R. The capital of Argenteuil county, it makes paper, woollens, furniture, etc., and has saw mills. Pop. 5,310.

Lacinium. The Latin name of a promontory on the E. coast of



Karl Lachmann,
German critic

Calabria, S. Italy. It is 7 m. S.E. of Cotrone (*q.v.*), and is now known as Capo delle Colonne. It was the site of a temple of Hera Lacinia, of which no more than a single column remains.

Lac Insect (*Coccidae*). Scale insect (order Hemiptera) abundant on forest trees in India. Its cutaneous secretion forms resinous incrustations on the smaller branches. See Lac.

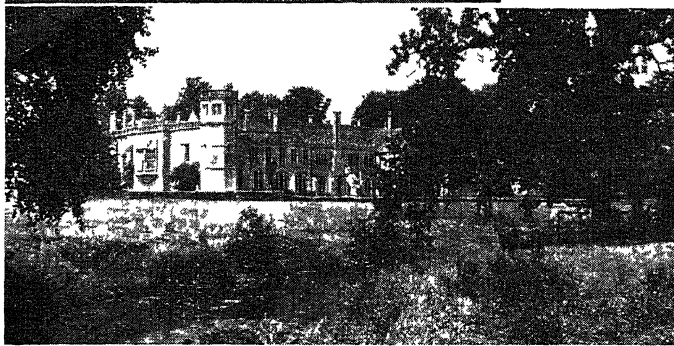
Lackawanna. River of Pennsylvania, U.S.A. Rising in the extreme N.E. portion of the state, it flows 50 m. S. and S.W. to the N. branch of the Susquehanna at Pittston. Its valley forms part of the richest anthracite region of the U.S.A., and contains many collieries and other industrial plants.

Lackawanna. City of N.Y. State, U.S.A., in Erie co. It is at the E. end of Lake Erie, 5m. S. of Buffalo, and is served by several rlys. The Bethlehem steel plant here processes about one-twentieth of U.S. steel. About a third of the pop. is of recent European origin. The basilica of Our Lady of Victory is one of two N. American churches designated by papal decree a basilica. Pop. 24,058.

Lackey Moth (*Malacosoma neustria*). Common British moth (family *Lasiocampidae*), whose caterpillar is often destructive to fruit trees, plagues of them occurring at intervals and resulting in defoliation. The eggs are laid in bands encircling the young twigs and the caterpillars live in tent-like webs of silk spun among the leaves and branches.

Lacmoid. A colouring matter prepared by heating resorcinol with sodium nitrite. When dissolved in alcohol and water, lacmoid is used as an indicator in volumetric chemical analysis. The bluish-violet colour of lacmoid changes to red on the addition of an acid. See Chemistry.

Lacock. Village of Wiltshire, England. Notable for its 15th century stone houses, it lies in the Avon valley between Chippenham and Melksham, and has a rly. station (W. region). Lacock Abbey, founded in 1229, on the W. bank of the Avon, by the countess of Salisbury for Augustinian canonesses, was seized by Henry VIII and sold to Sir William Sharrington, who pulled down the church and converted the buildings into a Tudor mansion. It shows a succession of architectural styles from E.E. and Perp. in the convent buildings, and Tudor work in the octagonal tower, to Georgian adaptations. Sharrington's descendants,



Lacock, Wilts. The Abbey, founded in 1229, converted into a mansion in 1539, and presented to the National Trust in 1944. Top picture, a corner of Lacock village, one of the most beautiful in England

the Talbots, possessed the property until 1944, when both village and abbey were presented to the National Trust. W. H. Fox Talbot (*q.v.*) was born here.

Laconia, GULF OF. Opening of the Mediterranean into the Morea, Greece, sometimes called the Gulf of Marathon. Separated on the W. from the Gulf of Kalamata, by the tongue of land of which Cape Matapan is the extremity, and having Cape Malea on the E., it is 35 m. long, and about 40 m. wide at its mouth. The island of Cerigo, the ancient Kythera, lies 15 m. S.W. of Cape Malea. The southern portion of the Peloponnesus to the N. of the gulf forms the administrative district of Laconia, mainly comprising the valley of the Iri; its chief town is Gytheion.

Lacordaire, JEAN BAPTISTE HENRI (1802-61). French priest and orator. Born at Recey-sur-Ource, near Dijon, March 12, 1802, he was educated at Dijon and studied law. He became an advocate and practised in Paris; at first a follower of Rousseau and hostile to clerical influences, about 1822 he decided, convinced, it is said, by Lamennais's Essay on Indifference, to become a priest. Having studied at S. Sulpice, he was ordained in 1827. He became a member of the Collège Henri IV,

audiences in the Collège Stanislas, while his preaching attracted thousands to Notre Dame. In 1836 he went to Italy, filled with the idea of restoring the order of S. Dominic in France. He there joined the order, and, having been made a provincial, founded in 1840 a house for it at Nancy. As a Dominican monk Lacordaire returned to his preaching; his conferences were renewed, while his eloquence was shown at funerals. In 1848 he was elected as a deputy to the national assembly, but resigned in 1850; in 1860 he was elected to the Academy. Head of a school for boys at Sorrèze, he died Nov. 22, 1861. See *Preaching*; consult *Lives*, C. F. R. de Montalembert, Eng. trans. 1863; D. Greenwell, 1867; C. Foisset, 2 vols., 1870; H. L. S. Lear, 1882.

Lacoste, JEAN RENÉ (b. 1905). French lawn tennis player. One of the "Four Musketeers" (with Borotra, Brugnon, and Cochet), he first represented France in the Davis Cup in 1923. In 1925 he won the singles championship of

and then joint editor with Lamennais of *L'Avenir*, a paper designed to further liberal ideas in the church, a course condemned by the pope.

About 1834 Lacordaire began his great work as a preacher. He spoke to crowded and cultured

France and the All-England at Wimbledon; in 1926-27 the U.S. singles title; and again at Wimbledon in 1928. Ill-health caused his retirement in 1929, and after an attempt to resume competitive play in 1932, he became non-playing captain of the Davis Cup team. His game was remarkable for accuracy and persistence.

Lacquer. The term for various products, some natural, some synthetic, used as finishing coats usually characterised by a hard lustrous surface. It was first applied to the characteristic Oriental ware, remarkable for its highly decorative quality and the hardness and brilliance of its finish, which became popular in W. Europe in the 17th and 18th cents. This lacquer ware was of two distinct types—the Indian, based upon lac resin (*see Lac*) and the Chinese and Japanese, based on a group of natural liquid varnishes.

The Indian process consisted in fusing the lac resin and mixing it with pigments to produce a substance similar to sealing wax. This when applied to a surface and polished gave a brilliant lustrous finish. The characteristic spiral decoration on cylindrical objects was produced by putting the article in a lathe and pressing a stick of the pigmented lac against it. Frictional heat was sufficient to soften the resin and produce a smear of colour upon the article. In other cases the hot plastic mass was applied to the surface and shaped and polished as desired.

The liquid medium used in the production of Japanese and Chinese lacquer ware is the exudation from a tree *Rhus vernicifera*, known in Japan as Urushi No-ki and in China as Tsichou. The process appears to have originated in China, but reached its highest development in Japan. The trees are tapped systematically and yield a milky fluid which, on standing, separates into two layers, the upper giving the better quality lacquer. The exudation is filtered and mixed with pigments as desired. The film dries on exposure in a moist, but not in a dry atmosphere, thus behaving in the reverse manner to the drying oils used in western varnish manufacture. Temperature is also important—about 20° C. is said to be the best. The method of working has been kept secret, but the result is an extremely hard brilliant finish resistant to acids, alkalis, and heat up to 160° C.

Attempts to match Oriental lacquer gave a great impetus to



J. B. H. Lacordaire, French priest

the study of varnish in the W. Until after 1918 French polish and other shellac varnishes and hard resin-oil varnishes, sometimes pigmented, were the principal materials used, though synthetic coatings based on nitro-cellulose were also used to some extent. After the First Great War, by suitably modifying the condition of nitrating cellulose and subsequent treatment of the nitro-cotton, it was found possible to make grades of nitro-cellulose soluble in mixtures of organic liquids which could be selected so as to give the desired rate of drying and quality of film. The addition of small amounts of other non-volatile organic solvents give the film the necessary elasticity and toughness; while resins, notably dumar resin, contributed to the solid content and durability of the film without unduly increasing its viscosity. Such lacquers are adapted for application by spray gun—the production of a lacquer suitable for application by brush proved difficult. These lacquers dry very rapidly by evaporation. They can be used clear or pigmented and in either case give a coat of high gloss, water-resistance, and durability. Their use has been extended to almost every branch of industry, including house decoration; but the toxicity, inflammability, and odour of the volatile ingredients necessitates special precautions in their application. Nitro-cellulose itself is also inflammable. Various other compounds of cellulose have been tried, notably acetate, which is virtually non-inflammable, but none equals the nitro compounds in range of solubility, if cheaper diluants, such as toluene and white spirit, must be used.

DOPES. Cellulose lacquers are used in the manufacture of aeroplane dopes which, before the development of all-metal aircraft, were of vital importance. The dope not only protected the fabric but caused it to contract, thus making it taut upon the framework. For this purpose, inflammability was a most serious objection, and nitro-cellulose was replaced by acetate.

T. Hedley Barry

Lacrima Christi. Italian wine.

It is made from a muscat grape grown on the S. slopes of Mt. Vesuvius. A delicate sweet wine, of peculiar flavour and rich bouquet, it is of two kinds—light and dark amber, the white having the more piquant flavour. Little is made, the Lacrima Christi of commerce being obtained from the Naples dist., Istria, and the Greek islands.

Lacroma. Island off the coast of Herzegovina, Yugoslavia. It lies half a mile S. of Ragusa (Dubrovnik), and is 1 m. long by $\frac{1}{4}$ m. broad. On it is the convent of San Marco, at one time in the occupation of the archduke Maximilian, who became emperor of Mexico. Richard I of England is said to have been wrecked here on his return from the Holy Land in 1192, and in gratitude for his escape founded the convent and also the cathedral of Ragusa.

Lacrosse (Fr. *la crosse*, crosier). Winter ball game played between teams of twelve on a pitch about 100 yds. by 50 yds. A very popular game for girls, it is played by about 170 girls' boarding schools and 80 day schools in England alone. There are ladies' inter-

national, territorial, and county matches. As a men's game it is played by schools and clubs round Manchester, London, and Bristol. There is an annual Oxford v. Cambridge match, the universities awarding half-blues. Representative teams from the N. and S. of England play an annual match and, after the knock-out club tournament in the N. and S., the winners play for the Iroquois Cup. These games are organized by the English Lacrosse Union.

Lacrosse was developed by Canadians from a N. American Indian game called "baggat-away," still played in the Indian reserves. The Jesuit missionaries in Canada called it lacrosse because each player caught and threw the ball with a stick shaped like

a bishop's crosier with a little net at its curled end. All the men of one village played all the men of the next; the goals were half a mile apart and the teams numbered about 800. To encourage their men the squaws beat them with switches.

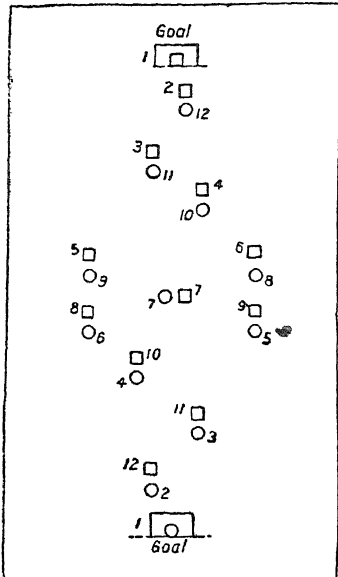
Lacrosse is a very fast game with no off-side rule and few stoppages. The sticks, which are made of hickory wood with a triangular net of pliable catgut and leather, vary in length from 40 to 50 ins. The ball is of rubber, $4\frac{1}{2}$ to 5 oz. in weight and about the size of a tennis ball. Players must wear rubber-soled shoes or boots, and all have gauntlet gloves padded on the knuckles and, in the men's game, padded jockey caps as well.

At the start of play the players take up the formation, shown in the diagram in the next page, and marking each other in pairs.



Lacquer. Portion of a six-fold screen of Chinese 18th cent. lacquer work upon wood. Landscapes and figures are in gold upon a black background, the whole surrounded by a border of fret design

Victoria & Albert Museum, S. Kensington



Lacrosse. Plan of field, players of opposing sides designated by squares and circles respectively. 1. Goal-keeper. 2. Point. 3. Cover Point. 4. Third man. 5 and 6. Defence fields. 7. Centre. 8 and 9. Attack fields. 10. Third home. 11. Second home. 12. First home

To start the game the players "face" the ball; in the girls' game they stand face to face with the ball held between the backs of their sticks. When the whistle blows, they draw their sticks sharply apart and make the ball fly out to the wings. In the men's game the ball is placed on the ground, but the same action is taken. Each side tries to pass the ball forward to a player who can shoot effectively at goal. Although the goal opening is only 6 ft. square, scores of over twenty goals a match are common.

To play well, a player must be a good sprinter, able to catch and throw the ball in almost any position on the run. In good lacrosse the ball is off the ground all the time. The aim of the attack player is to sprint free of his opposing "pair," and to take a pass and give one before being tackled. The defence player's first object is to prevent his opponent from running round him; body checking, but not shouldering or charging, is allowed. A player may use his stick to knock the ball out of his opponent's stick.

Lacrosse is a popular men's game in the colleges and universities of the U.S.A., especially in Maryland. The All America team which played seven matches in the U.K. in 1937 attracted over 6,000

spectators to its match against England at Stockport, which it won by 12 goals to 8.

Stephen Usherwood

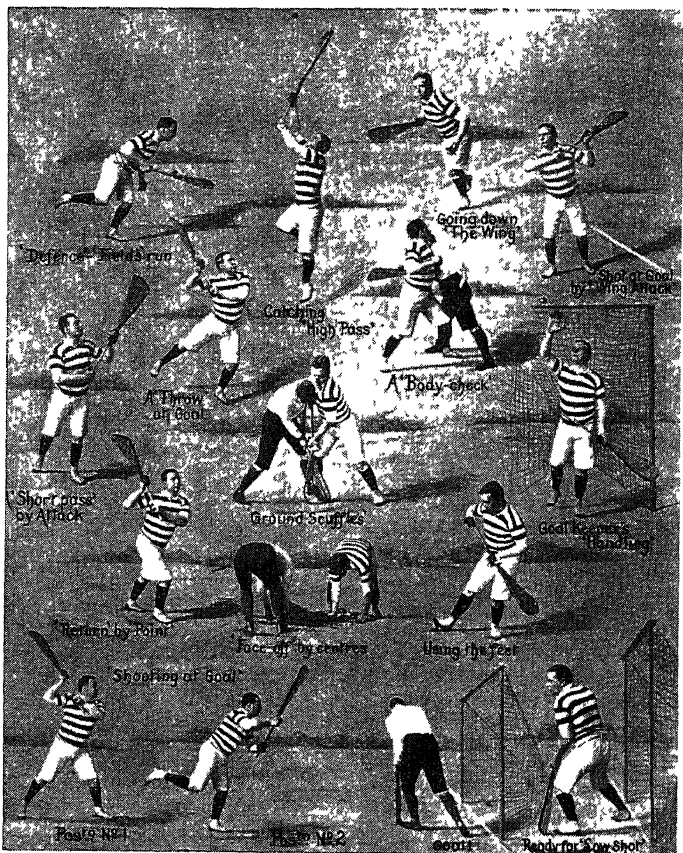
La Crosse. City of Wisconsin, U.S.A., the co. seat of La Crosse co. It stands at the junction of the Black and La Crosse rivers with the Mississippi, on the border of Minnesota, 125 m. S.E. of St. Paul, and is served by rlys. and river steamers. The principal buildings include the city hall, the federal building, and a fine public library. La Crosse trades extensively in tobacco and the produce of the surrounding cattle rearing and dairy farming district. It has large grain elevators and flour mills and manufactures of agricultural implements, lumber products, etc. Settled in 1841, it became a city in 1856. Pop. 59,653.

Lactantius, LUCIUS CAECILIUS FIRMIANUS (d. c. 330). Christian apologist. Possibly of Italian origin, he became a Christian in middle life, and was a pupil of Arnobius, author of the treatise *Adversus Gentes*. Diocletian appointed

him teacher of Latin in Nicomedia, whence he went to Gaul, where he became tutor of Crispus, son of the emperor Constantine. He died at an advanced age. He was known as the Christian Cicero from the purity of his Latin, which was enormously superior to the barbarous jargon used by contemporary writers. His chief work is the *Institutes of Divinity*, an exposition of Christianity. In another of his works, *De Mortibus Persecutorum*, is the first mention of the famous vision seen by Constantine at the Milvian Bridge, as a result of which the emperor was converted to Christianity.

Lactation (Lat. *lac*, milk). Term applied to the secretion of milk, and also to the period during which the infant is being suckled. During the first two days after delivery, the secretion from the breasts is a fluid called colostrum, which differs from milk in having much less casein but more albumen. On the third day a secretion of normal milk is established.

In the human mother the period of lactation is some nine months.



Lacrosse. Principal strokes and movements in this game of Canadian origin

but, as in all mammals, duration is modified by the quality and quantity of milk secreted and by the needs of the individual young; so that complete or partial weaning may take place at any unforeseen stage. As at all landmarks of the sexual life in human beings, morbid psychological states may show themselves during lactation.

Lacteal. Lymphatic vessel of the intestinal canal. They are so called because, during the process of digestion of food, they contain a white fluid resembling milk.

Lactic Acid OR α -HYDROXY-PROPIONIC ACID. A liquid discovered in 1780 by Scheele, in sour milk, from which its name is derived. It is obtainable by several methods but principally by the lactic fermentation of sugars, or carbohydrates which may be converted to fermentable sugars. Species of bacteria, yeasts, moulds, and some plants produce lactic acid. Usually a fermentation of about 5 or 6 days is required for complete conversion of the sugar to lactic acid. When fermentation is complete, sulphuric acid is added and the calcium lactate converted to lactic acid and calcium sulphate. The latter is removed and the weak acid concentrated. Lactic acid finds commercial use in the leather industry for removing lime from hides; in the dyeing and textile industries as a mordant and in acid dyeing of wools. It is being used increasingly in the food industries.

Lactoflavin. Vitamin B₂ in the Vitamin B range. It affects tissue respiration and metabolism. Deficiency of lactoflavin results in glossitis (inflammation of the tongue) and in cracks at the angle of the mouth. Yeast contains Vitamin B₂ with the rest of the B complex.

Lactometer. Special form of hydrometer used for estimating the specific gravity of milk. It is normally graduated between 1.025 and 1.035 s.g.

Lactones. Ester-like compounds of gamma and delta hydroxy-acids formed by the loss of a molecule of water from a hydroxyl and a carboxyl group present in the same molecule. Alpha-hydroxy-acids similarly yield lactides. Lactones are mostly neutral liquids showing many

of the properties of esters. The Greek letters used in designating hydroxy-acids refer to the position of the hydroxyl in relation to the carbonyl of the molecule.

Lactose OR MILK SUGAR. Kind of sugar found in milk. It is not so sweet as cane sugar, and does not undergo alcoholic fermentation. The souring of milk is due to the lactic acid fermentation which takes place in the presence of casein. The source of lactose is the whey from cheese factories and the separated milk of creameries. It is prepared on a large scale in Switzerland, Holland, and New Zealand. The whey is evaporated to dryness and the residue purified by dissolving it in water, adding alum, filtering through animal charcoal, and boiling down to a syrup, from which the lactose crystallises on strings. Lactose is used in humanising cows' milk for infants. See Sugar.

Lacy, FRANCIS MAURICE (1735-1801). Austrian soldier and count. The son of Peter Lacy (*v.i.*), he



F. M. Lacy,
Austrian soldier

was born at St. Petersburg, Oct. 21, 1735. He chose the Austrian army, and during the war of the Austrian Succession saw a great deal of fighting. In 1756, when the Seven Years' War began, he was a colonel, but was soon made a general, and in 1758 became chief of staff to Daun, a post he retained, much of the Austrian strategy being dictated by him. When peace came, he was entrusted as a field-marshal with the work of reforming the army. In general politics he was one of Maria Theresa's confidants, as also of her son Joseph II. He commanded Austrian troops in the short war of the Bavarian Succession, and against Turkey. Lacy died in Vienna, Nov. 24, 1801.

Lacy, PETER (1678-1751). Irish soldier and Russian count. Born at Killybeg, co. Limerick, Oct. 10, 1678, he was a boy when he helped to defend Limerick for James II. He sought fortune abroad and after short terms in the French and Polish armies, entered the

service of Russia. Under Peter the Great he did much to train the Russian soldiers. He was made a field marshal in 1736, and was also trusted by the empresses Anne and Elizabeth. He died May 11, 1751.

Ladakh. District of Kashmir. It is situated among the Himalayas and contains the valley of the Upper Indus. Wheat, barley, and millet are grown, and sheep are reared on the alpine pastures. Most of the people in the Ladakh subdivision on the E. are Mongoloid Buddhists; those of the W. are Mahomedans. Its area is 45,762 sq. m. Pop. 226,000.

Ladas. Name of two famous athletes of antiquity. One, of unknown date, belonged to Laconia, and won the long race at the Olympic games; he was the subject of a statue by the sculptor Myron. The other Ladas won the short race at the Olympic Games in 280 B.C. The name Ladas became proverbial for speed; it was given to a horse, belonging to Lord Rosebery, which won the Derby in 1894.

Ladder Veins. In geology, mineral deposits filling short transverse fissures sometimes cutting across dykes of igneous rock. When the dyke dips steeply, the transverse veins resemble the rungs of a ladder.

Lade. An island of Asia Minor, the ancient Caria. It lies opposite Miletus, and near here the Persians defeated the revolting Ionians, 494 B.C. *Pron.* La-dee.

Ladies' Challenge Plate. An English rowing event. Established in 1845, it is a race for eight oars rowed annually at Henley-on-Thames over a distance of 1 m. 550 yds. School and university eights are eligible.

Ladies of Llangollen. Name given to two Irishwomen, Lady Eleanor Butler (c. 1745-1829) and Sarah Ponsonby (1755-1831), once prominent in London society, who went in 1774 or 1779 to live at a property they purchased at Llangollen, Denbighshire, Wales. Proverbial for their long friendship, they engaged in country pursuits and the exercise of charity and hospitality. They were visited at their home, Plas Newydd, by Wordsworth, Scott, Byron, Burke, and Wellington. They have a monument in Llangollen churchyard. See Butler, Lady Eleanor, *illus.*

Ladislas. Masculine Christian name. The Slavonic Wladyslaw or Vladislav, it means glorious ruler, and has been borne by various kings and princes in



Lacto-
meter



Peter Lacy,
Irish soldier

Bohemia, Hungary, and Poland. It appears in English in various forms, Ladislaus and Wladislaus among them. The French form is Louis, the Hungarian Laszlo.

Ladislas I, king of Hungary, who began to reign in 1077, was a son of Béla I. He extended Hungary's boundaries, and did much to make his people Christians. Regarded as one of the country's greatest rulers, he was canonised, having died July 29, 1095, and figures largely in Hungarian legend. Other Hungarian kings of the name include Ladislas IV (1262-90), whose reign was a period of civil war, until the king was murdered, July 10, 1290. Ladislas V, called Posthumus, was a son of King Albert and the grandson of the emperor Sigismund. In 1444 he was chosen king of Hungary, and in 1453 crowned king of Bohemia, but he died Nov. 23, 1457. Bohemia had an earlier ruler of this name, who was made king in 1156 and abdicated in 1173.

Four Polish kings and several dukes bore the name. Wladyslaw I united Great and Little Poland in 1305, defeated the Teutonic Order in 1332, and reigned until 1333. Wladyslaw II was the founder of the Jagellon family. He was grand duke of Lithuania, and was chosen king of Poland on his marriage with the heiress of that country. He reigned for 48 years (1386-1434), and had made Poland a strong country before he died. Wladyslaw III, his son and successor, was chosen also as king of Hungary in 1440, but he was killed at the battle of Varna, Nov. 10, 1444. Wladyslaw IV, son and successor of Sigismund III, was king 1632-48. See Hungary; Poland.

Lado. Town on the left bank of the White Nile. It is 1,068 m. S. of Khartum. Here Gordon in 1878 formed a station, which afterwards became the most important Belgian post on the Nile, and was for some time the headquarters of Emin Pasha. The surrounding district, known as the Lado Enclave, reverted on the death of Leopold II, king of the Belgians, to the Anglo-Egyptian Sudan and is now included in the province of Equatoria. See Sudan.

Ladoga. Largest European lake. It is bordered by the Karelo-Finnish S.S.R. and Leningrad region, R.S.F.S.R., 125 m. long, 80 m. wide, and from 300 ft. to 800 ft. in depth. Along its shores canals have been made to obviate the dangers of its navigation and

to facilitate traffic. It contains a number of small islands, on two of which are monasteries much visited by pilgrims.

Lake Ladoga was the centre of fierce fighting during the Russo-Finnish war of 1939-40. Under the terms of the peace treaty Finland ceded to Russia territory N. and W. of the lake, including the town of Sortavala. Finland joined Germany in the attack on Russia in 1941, and advanced round the lake until by mid-Nov. she held a line a few m. N. of Leningrad W. of the lake, and along the Svir river E. of it; while the Germans, having captured Schluselburg Sept. 7, held some 20 m. of the S. shore, and Leningrad (*q.v.*) was invested.

The Russians again captured Schluselburg and cleared the S. shore Jan., 1943; the E. and W. shores were not cleared until on June 10, 1944, the Russians attacked in the Karelian isthmus, on June 20 E. of the lake. By July 12 they were in control of all its shores. The peace treaty of 1944 restored the 1940 frontier. See map.

Ladon. In Greek mythology, the sleepless dragon with the hundred heads which guarded the golden apples in Hera's gardens of the Hesperides (*q.v.*).

Ladrones. Chain of islands in the N.W. Pacific Ocean, also known as Marianne Islands (*q.v.*).

Lady. Title of honour. It is used informally of a marchioness, countess, viscountess, or baroness. The daughter of a duke, marquess, or earl has Lady prefixed to her first name and surname. The wife of a younger son of a duke or marquess has Lady prefixed to her husband's first name and surname.

The wife of a baronet or knight is commonly known as Lady with her husband's surname; the formal title is Dame with the wife's first name and the husband's surname. The word comes from the A.S. *hlafdige*, bread-kneader, applied to the mistress of the house.

Ladybank. A police burgh of Fife, Scotland. In full, Ladybank and Monkston, it is 5½ m. S.W. of Cupar. It is an important railway junction, and there is a locomotive depot here. Pop. 1,168.

Ladybird (*Coccinellidae*). Popular name of an extensive family of small beetles, with hemispherical



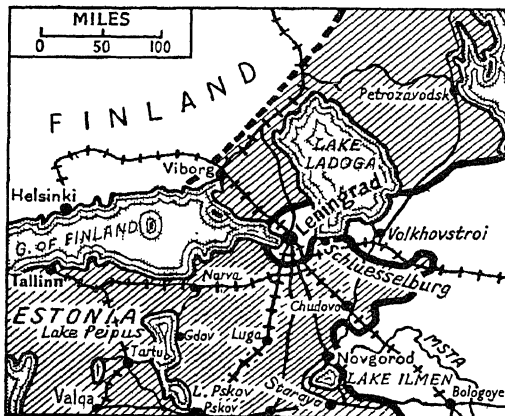
bodies and mostly red, yellow, or brownish in colour and decorated with a varying number of black or pale spots. The seven-spot (*Coccinella 7-punctata*) and the two-spot (*Adalia bipunctata*) are the two most familiar species in the U.K. Most ladybirds and their larvae

prey upon aphides, etc., and are consequently of great economic importance. One species, the Australian *Novius cardinalis*, has been introduced into most countries producing citrus fruits, as it preys upon their destructive



enemies, the cottony cushion scale insect. Several thousand species are known, some 45 kinds being found in Great Britain.

Lady Bower Dam. Third and largest of the dams built as part of the Derwent Valley Water Board (*q.v.*) scheme. The dam, which is 1,250 ft. long and 135 ft. high, was begun in 1935 and declared open by King



Ladoga. Scene of operations round Lake Ladoga during the German investment of Leningrad. Thick black line: limit of German advance; broken line: Russo-Finnish frontier

George VI on Sept. 25, 1945. It impounds a lake covering 40,000 acres, the largest artificial lake in England, and supplies water to Derby, Nottingham, and Leicester.

Ladybrand. Town in Orange Free State, S. Africa. It is near the Maluti Mountains, about 15 m. N. of Maseru in Basutoland. The town is the centre of an administrative district of the same name, which is separated from Basutoland by the Caledon river. It is the terminus of a branch rly. connecting with Bloemfontein and Bethlehem. Near by are caves with remarkable prehistoric paintings. Pop. 6,723.

Lady Chapel. In eccles. architecture, the name applied to the chapel of a cathedral or church where the altar of the Virgin was placed. The Lady chapels of the more important cathedrals had almost the character of detached structures; there is a very beautiful Early English example at Hereford. It was not, however, till the 14th century that this feature of a church became, in conformity with the development of

Originally it referred to any day in the church calendar commemorating an event in the life of the Virgin, e.g. the Conception (Dec. 8), the Nativity (Sept. 8), the Assumption (Aug. 15). In England Lady Day is a quarter day.

Lady Fern (*Asplenium filix-foemina*). Fern of the family Polypodiaceae, of

world-wide distribution. It has a stout root-stock clothed in rusty brown scales, and large, broad, lance-shaped leaves of soft texture. These are cut into leaflets (pinnae) which are dissected into toothed pinnules. The black clusters of spore-cases are covered with a kidney-shaped scale (indusium). The lady fern luxuriates in shady damp places, but may also occur in open or hilly situations.

Lady in Waiting. Woman of high birth or title appointed to the

British royal household as personal companion and attendant on the queen and other royal ladies. The queen's ladies in waiting are seven: three ladies of the bedchamber and four women of the bedchamber. The former attend the queen on all the state occasions when she is

accompanied by the king. Women of the bedchamber, who have apartments in the royal residence, attend the queen when she is not accompanied by the king, and perform secretarial duties. The queen mother's household includes a similar establishment. In 1950 there were four ladies in waiting attached to Princess Elizabeth's household; one to Princess Margaret's; six to that of Princess Mary; and two each to the households of the duchesses of Gloucester and Kent.

Lady Margaret Hall. Oldest of the four women's colleges in Oxford university, founded 1878. The buildings, designed mainly by Sir R. Blomfield and Sir Giles Scott, stand on a fine site to the

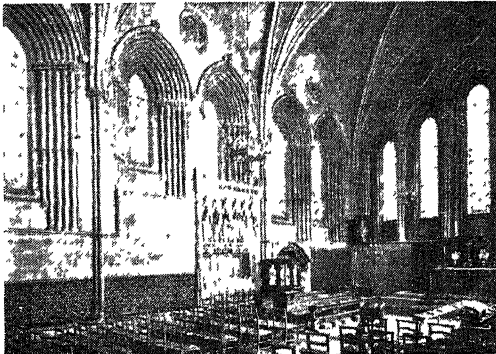


Lady Margaret Hall. Oldest of Oxford's four women's colleges, having been founded in 1878

N. of the University Parks, and the grounds stretch to the river Cherwell. The college can accommodate 160 undergraduates. An examination is held annually, on the results of which scholars and exhibitioners are elected and commoners chosen. They read for a degree in one of the final honour schools or in medicine. There are fellowships and scholarships for graduates. The Lady Margaret after whom the college was named was the Countess of Richmond and Derby, mother of Henry VII.

Lady of Lyons, THE. Drama in five acts by Edward Bulwer-Lytton, produced at Covent Garden Theatre, London, Feb. 15, 1838. The story, how Claude Melnotte, a gardener's son, tricks Pauline, the proud and beautiful daughter of a wealthy merchant of Lyons, into marriage and afterwards wins her grateful love, is derived from Mrs. Aphra Behn's *The False Count*, 1682. Romantic and theatrically effective, Lytton's play was a great success when first produced with Macready and Helen Faucit in the principal parts, and it has been reproduced frequently.

Lady of the Lake, THE. Third and most popular of Sir Walter Scott's poems. Published in 1810, it is in six cantos, the scene being laid chiefly in the vicinity of Loch Katrine, in Perthshire, the time of the action extending over six days. FitzJames, James V in disguise, during a deer hunt loses his way in the Trossachs and meets Ellen Douglas, "the Lady of the Lake," daughter of a former favourite of the king, but now an outlaw under the protection of Roderick Dhu; and the chance meeting leads to reconciliation. Scott's five pictorial descriptions of the scenery have drawn tourists to Loch Katrine and the vicinity. See *Ellen's Isle*.



Lady Chapel. North side of Lady Chapel of Hereford Cathedral, built c. 1220, showing the clustered window shafts and Perpendicular tomb of a 14th century knight

the cult of the Virgin, of widespread importance. See *Architecture*; *Cathedral*; *Gloucester*.

Lady Chatterley's Lover. A novel by D. H. Lawrence. First issued at Florence in 1928, it was banned in Great Britain on account of certain words and phrases often heard in vulgar parlance but not permitted in print. An expurgated edition, published in London in 1932, had a sensational success in the U.K. and U.S.A. The theme concerns the frustrated life of Constance Chatterley, who, married to an invalid, attains happiness with his gamekeeper, whom she ultimately weds.

Lady Day. Name now applied to March 25, the Feast of the Annunciation of the Virgin Mary.

Lady Precious Stream. Comedy by S. I. Hsiung. Based on a Chinese traditional piece, and reminiscent in its impressionism of a Japanese Nô-play, this proved a success at the Little Theatre, London, Nov. 27, 1934. Depending dramatically on an impromptu style of acting, with action suggested by miming, its apparent simplicity was enhanced by absence of scenery or properties. It was twice revived at the Little in 1935, and at the Open Air Theatre, Regent's Park, 1944 and 1947.

Lady's Mantle (*Alchemilla vulgaris*). Perennial herb of the family Rosaceae. It is a native of



Lady's Mantle. Foliage and flower-heads; inset, flower, showing sepals

Europe, N. and W. Asia, Greenland, and Labrador. It has a short, stout rootstock and large, serrated leaves with lobed margins, thrown into plaits from the centre to the circumference. The small yellow-green flowers are in numerous clusters or short sprays. They have no petals. The rootstock, edible and astringent, is used in rustic medicine.

Ladysmith. Town of Natal, S. Africa. It stands at a height of over 3,000 ft. on a slope near the Klip river, about 30 m. from the Drakensberg Mts. It is 190 m. by rly. N.W. of Durban. The chief buildings are the town hall, court house, and several churches, including the Anglican church with

memorials to those who fell in the siege. It was named after the wife of Sir Harry Smith. Pop. 9,702.

Ladysmith, SIEGE OF. Boer operation in the S. African War (q.v.). When war broke out the British had some garrisons in Natal, Sir G. White being in command, which it was necessary to concentrate in Ladysmith. On Oct. 30, 1899, White, in the engagement known as Lombard's Kop, made a general assault on the Boer positions, but lost heavily and was obliged to withdraw into the town again. One detachment, 1,000 strong, sent to Nicholson's Nek, was destroyed. By the end of the month the investment was complete. Inside were 12,000 British cavalry, infantry, and artillery, with a naval brigade hurried up at the last minute, and outside were 20,000 Boers. The last train got out on Nov. 2, and the same day the telegraph wire was cut. The siege lasted until Feb. 28, 1900, the early efforts to relieve it made by the force under Sir R. Buller being failures. On Jan. 6 the Boers made a determined attempt to carry the town by direct assault, but the attack was beaten off. The British losses were 420. Provisions ran short and 2,000 cases of disease were in the hospitals at one time.

Lady's Slipper Orchid (*Cypripedium calceolus*). Herb of the family Orchidaceae. A native of Europe and N. Asia, it has a creeping rootstock and a leafy stem a foot or more high. The flowers (one or two only) are large and slipper-

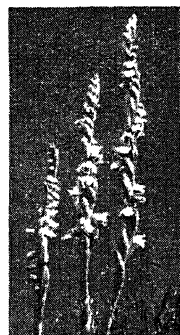


Lady's Slipper Orchid, *Cypripedium hirsutum*, an American variety

shaped, reddish-brown, except the large upturned lip, which is pale yellow. The genus *Cypripedium*, which is represented in most of the tropical and temperate regions, includes many species, but the flowers, though differing in size and colour, are of much the same form as the European species.

Lady's Smock. Alternative popular name for the plant also known as cuckoo-flower (q.v.).

Lady's Tresses (*Spiranthes autumnalis*). Perennial herb of the family Orchidaceae. It is a native of Europe and N. Africa. It has two or three egg-shaped tubers from which, in Aug., arises the single, slender-flowering stem with a few slender leaves and a row of small white fragrant flowers, this part of the stem being spirally twisted. Later a rosette of oval leaves is produced direct from another tuber. The plant occurs on hillsides and in dry pastures. Another species, the summer lady's tresses (*S. aestivalis*), is a bog plant with cylindric tubers, and the flowering stem arises amid the root-leaves.

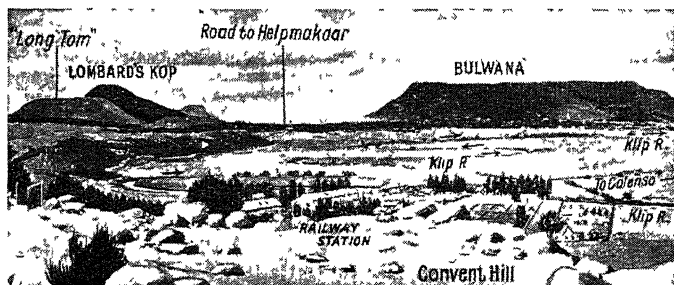


Lady's Tresses. Flower stems

Lady Windermere's Fan. A comedy by Oscar Wilde, produced Feb. 20, 1892, by (Sir) George Alexander (who played Lord Windermere), at the St. James's Theatre, where it had a run of 156 performances. The comedy is one of Wilde's wittiest, some of the epigrams spoken by Lord Darlington being classic examples of the art. There was a revival at the Haymarket in 1945.

Lae. Coast town in the Morobe dist. of Australian New Guinea. There is a trading station and a small harbour in Huon Gulf. After Japanese forces had obtained a base at Rabaul, New Britain, in Jan., 1942, Lae was bombed a number of times by Japanese aircraft before they landed there on March 8, the town then becoming a target for Allied aircraft until recaptured by Australian troops on Sept. 16, 1943.

Laeken. Suburb of Brussels. It lies N. of the city and contains a palace, one of the residences of the king of the Belgians. This was built in 1782-84, largely



Ladysmith, South Africa. Outskirts looking east, the town itself lying beneath Convent Hill. The Boer gun Long Tom bombarded the town from the direction of Lombard's Kop

rebuilt after a fire in 1890, and enlarged in 1903. Napoleon bought it and for a time resided there. After the surrender of the Belgian forces to the Germans in May, 1940, King Leopold III lived here in seclusion with his mother, under German guard, until he was deported to Germany in June, 1944. The church of Notre Dame at Laeken is an outstanding modern Gothic building. On a hill near is a memorial to Leopold I. Electric tramways connect Laeken with the centre of Brussels.

Laekenien. In geology, name given to a subdivision of rocks of the Eocene period. It is so called from Laeken, in Belgium, where it occurs. *See* Eocene.

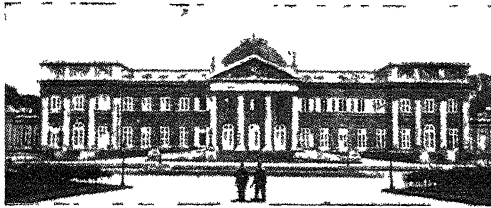
Laelia. A genus of epiphytes of the family Orchidaceae. They are natives of the warmer regions of America, chiefly Mexico and Brazil. The pseudo-bulbs are slender, club-shaped or spindle-shaped. The leaves are thick and leathery, the flowers large and showy.

Laelius, GAIUS (c. 235–170 B.C.). Roman general and statesman. Intimate friend of Scipio Africanus the elder, he took part in his Spanish and African campaigns, distinguishing himself at Zama, 202, as a cavalry leader. He organized the newly-conquered province of Cisalpine Gaul. His son, also Gaius, was the patron of Terence and other literary men, and the chief interlocutor in Cicero's dialogue *On Friendship*.

Laemmle, CARL (1867–1939). German-born American film director. Born at Laupheim, Jan. 17, 1867, he went to the U.S.A. and became a book-keeper in a drug store. Having opened his first cinema, the Whitefront, in Chicago in 1906, he next year exhibited his film *Hiawatha*, and became in 1912 one of the original partners in Universal Pictures Corporation. Of films which he supervised or for which he was responsible, the most notable was probably *All Quiet on the Western Front*. He died Sept. 24, 1939. A biography was pub by John Drinkwater, 1931.

His son, of the same name (b. 1908), was general manager of all the Universal productions, 1929–36. He later became an independent director.

Laennec, RENÉ THÉOPHILE HYACINTHE (1781–1826). French physician. Born at Quimper,



Laeken, Belgium. Façade of the royal palace

Feb. 17, 1781, he studied medicine in Nantes and Paris. In 1816 he became physician to a hospital in Paris, and in 1823 he was made professor of medicine at the Collège de France. He died in Brittany, Aug. 13, 1826. Laennec is known as the inventor of the stethoscope, and the author of a notable work on Auscultation, 1819.

Laertes. In Greek legend, the aged father of Odysseus. When Odysseus returned after his 20 years' absence from Ithaca, he found his father still alive, and their meeting is described by Homer in a passage of great tenderness and beauty.

Laertes. Character in Shakespeare's tragedy *Hamlet*. After the death of his sister Ophelia, he mortally wounds Hamlet with a poisoned foil during a fencing bout, and dies himself from a wound inflicted when the foils are accidentally exchanged.

Lafayette. A city of Indiana, U.S.A., the co. seat of Tippecanoe county. On the Wabash river, it is 64 m. N.W. of Indianapolis, and is served by several rlys. In adjoining West Lafayette, across the Wabash, is Purdue university, a co-educational, state-supported institution noted for its work in scientific agriculture, which has a 224-acre airport. In an agricultural area, Lafayette ships wheat, maize, oats, cattle, and hogs. Industrial plants include rly. shops, packing houses, lumber and flour mills, etc., and manufactories of aluminum, steel and wire and sponge-rubber products, motor accessories, electrical appliances, strawboard, soybean oil, etc.

In the vicinity are the sites of the Miami Indian village of Ouia-tonen, which in 1718 consisted of five contiguous communities, and of Fort Ouia-tonen, one of the first white settlements in Indiana, erected by the French about 1720; and also the battlefield of Tippecanoe where, on Nov. 7, 1811, 900 Americans under William Henry Harrison, governor of Indiana Territory (who became president of the U.S.A. thirty years later) defeated a force of

Indians. The battlefield is a state and national park, and there is a 92-ft. monument.

Lafayette was settled permanently in 1820, and incorporated in 1854. Pop. 28,798.

Lafayette. A city of Louisiana, U.S.A., and the seat of Lafayette parish. Situated on the Vermilion Bayou, 145 m. W. of New Orleans, it is served by the Southern Pacific Rly. and an airport. The neighbourhood produces sugar cane, rice, cotton, maize, sweet potatoes, and dairy products; there are deposits of oil, sulphur, and salt. An important shipping centre because of its rly. facilities and its nearness (19 m.) to the Intra-Coastal Waterway, Lafayette has rly. shops, cotton gins, sugar refineries, creameries, packing plants, canneries, and lumber mills, and many minor manufactures.

The largest town of the part of Louisiana settled by Acadians (known locally as "Cajuns") who fled from English persecution in the latter half of the 18th cent., Lafayette retains the French language and French customs. Many of the negroes, who constitute 29.3 p.c. of the pop., speak only a French patois. A plantation settlement in revolutionary days, it was laid out in 1824, incorporated as a town in 1836, and became a city in 1884. Pop. 19,210.

Lafayette, MARIE JOSEPH PAUL YVES ROCH GILBERT DU MOTIER, MARQUIS DE (1757–1834). French soldier and statesman. Born of a noble family at Chavagnac, Haute-Loire, Sept. 6, 1757, he became an orphan and financially independent at 13. The outbreak of the struggle of the American colonists for independence fired his imagination, and, fitting out a vessel himself to aid them, he landed in S. Carolina in 1777. He received the brevet rank of major-general from congress, and was wounded at Brandywine in Sept.; later he commanded a division. During 1779 he brought reinforcements from France, and throughout the later stages of the war rendered diplomatic services to the American cause.

In 1789 he represented the Auvergne nobility in the states-general, being a prominent spokes-



Lafayette

man of reformist doctrines there and later in the Constituent Assembly. He proposed the tricolor as the revolutionary flag, and was made commander of the National Guard, whom he led to Versailles on the fateful Oct. 5. Strongly criticised for his suppression of a popular demonstration on the Champ de Mars during 1791, he was nevertheless given command of an army against Austria. But he felt himself unable to support Jacobin policy against Louis XVI, and on Aug. 19, 1792, was formally declared a traitor to the republic, and took refuge in Liège.

Returning to France in 1799, he continued to take part in politics for the rest of his life, opposing Napoleon's assumption of the imperial title, and sitting in the chamber of deputies 1818-24 and 1825-34. Enthusiasm greeted him on a visit to America in 1824. He died in Paris, May 20, 1834. See *French Revolution*; *Tricolor*.

Bibliography. Life, B. Tucker-man, 1889; With L. in America, O. Roberts, 1919; Father of the Revolution, P. Guedalla, 1926; Lafayette, B. Whitlock, 1929; L., a Revolutionary Gentleman, M. de la Bedoyère, 1933.

La Fayette, MARIE MADELEINE PICHOT DE LA VERGNE, COMTESSE DE (1634-92). A French novelist.



Comtesse de la Fayette, French novelist

Born March 16, 1634, she was a daughter of a governor of Havre, and married in 1655 Count François Motier de la Fayette. A woman of much talent and learning, she

was a friend of Mme. de Sévigné, and, after being left by her husband, was the intimate of La Rochefoucauld (*q.v.*) from 1665 until his death in 1680. Her first novels, *La Princesse de Montpensier*, 1662, and *Zayde*, 1670, were of the current romantic type; but in 1678, under the name of de Segrais, she brought out *La Princesse de Clèves*, which is important as showing a break with the old tradition of romances; it is often held to be the first psychological novel in French. She died in Paris, May 25, 1692. Her *Life of Henrietta of England* did not appear until 1720.

Lafayette (d. 1911). Stage name of William Neuberger, who called himself the Great Lafayette, illusionist. Born at Baden-Baden and emigrating as a youth to

America, at an early age he made a large fortune by his stage illusions. His notoriety was increased by the luxury in which he lived and his lavish expenditure on his pet dog, Beauty. He was performing at the Empire music hall, Edinburgh, May 9, 1911, when, owing to a short circuit, the stage caught light and the whole building was soon in flames. In his attempt to save a performing horse, Lafayette lost his own life.

Laffitte, Jacques (1767-1844). French statesman. Born at Bayonne, the son of a carpenter,



Jacques Laffitte, French statesman

Oct. 24, 1767, he became a bank clerk in Paris in 1800. There his great financial abilities made him an important figure in the French banking world. He was governor of the Banque de France, 1814-19, and sat in the chamber of deputies from 1816 onwards. He took an active part in the Revolution of 1830, and became minister of finance and president of the council in the new government, but estrangement with his party caused his resignation in 1831. He died May 26, 1844.

La Folette, ROBERT MARION (1855-1925). American politician. Born at Primrose, Wis., June 14, 1855, he was called to the bar in 1880. Entering politics, he became an active member of the Republican party. He was governor of Wisconsin, 1901-07, and U.S. senator from 1905 onwards, being particularly active in rly. legislation. Strongly averse to American participation in the First Great War, he opposed the Armed Ship Bill in 1917. La Folette advocated equalisation of taxes and state control of rlys. He wrote a *Narrative of his Political Experiences*, 1913. He died June 17, 1925.

La Fontaine, JEAN DE (1621-95). French poet and fabulist. Born at Château-Thierry in Champagne, July 8, 1621, he was educated at first for the Church. He turned, however, to the law, which he abandoned on being appointed to a readership of the duchy of Châ-

teau-Thierry in 1647. In the same year he married, and from about 1660 lived chiefly in Paris.

Comparatively late in life La Fontaine turned to literature, having obtained a pension from Fouquet. The first volume of his *Contes* was published in 1664, though three years earlier he had produced the first of his memorable works, *L'Élégie aux Nymphes*, and in 1663 his *Voyage en Limousin*. In 1668 came a second series of *Contes* and the first six books of the famous *Fables* which were to prove their author's most enduring monuments; a second series of *Fables* followed in 1679 and a third in 1693. These moral stories, rendered in wonderfully easy and varied verse are regarded as among the glories of French literature.

In 1684, despite the laxity of the *Contes*, which had been severely criticised, La Fontaine was elected a member of the Academy. Unpractical and ingenuous, he had a certain genius for friendship and with Molière, Racine, and Boileau formed an intimate quartette notable in the history of literature, while a succession of wealthy patrons took delight in providing him with maintenance. He died in Paris, April 13, 1695. He is probably more read than any Frenchman of his time save Molière. His complete works are included in *Les Grands Écrivains de la France*, J. A. A. Regnier, 1883-92. La Fontaine et ses *Fables*, H. Taine, many editions, is the standard assessment. Sir E. Marsh translated the *Fables* into English, 1934.

Lafontaine, SIR LOUIS HIPPOLYTE (1807-64). Canadian politician. Born at Boucherville, Quebec, Oct. 4, 1807, he was educated at Montreal and became a barrister. He entered the legislature of Quebec in 1830 and followed Papineau; he did not, however, go to the extent of taking up arms in 1837, although his share in the movement led to imprisonment. After the union of the two Canadas in 1841, Lafontaine became the leader of his party, and in 1842-43 he and Robert Baldwin were the heads of the government. During 1848-51 the two were again in office, but Lafontaine then retired. In 1853 he was made chief justice of Quebec, and in 1854 a baronet. He died Feb. 26, 1864. *Consult* Life, A. de Celles, 1907.

Lagash. Sumerian city at Tello, S. Babylonia. The Semitic form of the name is provisionally



De la Fontaine

read Shirpurla or Shirgulla. The earliest personage identified is the patesi Lugalshagengur, who ruled under Meslim, king of Kish. Within a century Eannatum made Lagash the S. Babylonian capital. This dynasty ended with the reformer Urukagina, after whom the city was ruled until 2400 B.C. by patesis owning allegiance to Akkad, Erech, and Ur. See Babylonian.

Lager (Ger., store). Light beer originating in S. Germany. Lager ale is made by decoction and the bottom fermentation system, at low temperatures. Fermentation is not completed, and thus carbonic acid gas is formed and a sweet taste imparted, some of the malt extractives remaining unchanged. Lager is stored for a time in cellars kept a few degrees above freezing-point, and when in draught the casks are iced. Its low alcoholic content, some 3 p.c., requires that the beer be consumed immediately the barrel is broached, since it speedily becomes flat. See Brewing.

Lagerlöf, SELMA OTTILIANA LOUISA (1858-1940). A Swedish novelist. Born Nov. 20, 1858, in Värmland, she went in 1882 to Stockholm to be trained as a teacher, a career she abandoned for literature. In 1890 she won the prize in an open competition by a collection of early stories; their publication in 1891, under the title of Gösta Berling's Saga, Eng. trans. 1898, at once placed her in the front rank of contemporary Swedish writers.

In 1894-99 she published several books of stories and legends and two novels, *An Adventure in Vineta*, and *The Story of a Country House*. In 1895 her two-act play, *S. Anne's Cloister*, was performed in Copenhagen. The first part of her greatest novel, *Jerusalem*, 1901, was followed by a second part in 1902, Eng. trans. 1903. She was awarded the Nobel prize for literature in 1909, and in 1914 was elected a member of the Swedish Academy, the first woman so honoured. *The Outcast*, 1920; *The General's Ring*, 1925; *Anna Svörd*, 1927; all showed that her style alone would have placed her high among writers; but her claim to a larger fame lies in her warm humanity, wide outlook, and

beautiful presentation of simple life and character. She died March 16, 1940, at Marbacka, home of her childhood.

Lagerstroemia. A genus of trees and shrubs of the family Lythraceae. Natives of E. Asia.



Lagerstroemia. Foliage and flowers of *L. flos-reginae*

they have opposite, undivided leaves, and large handsome flowers in clusters or sprays. *L. flos reginae* has flowers which are rosy in the morning and gradually deepen in colour until in the evening they are purple. It grows to a height of 60 ft., and furnishes a soft timber of a blood-red colour, used for boat-building. The root, bark, leaves, and seeds have medicinal properties, and are much used by Indian physicians.

Laggan. Loch or lake of Inverness-shire, Scotland. It is 7 m. long and is drained by the Spean. It was brought into the Lochaber hydro-electric scheme. On the river Spey, 6 m. to the N.E., is the hamlet of Laggan.

Lagoa dos Patos (Port., duck lake). Lagoon of Brazil. It is in the state of Rio Grande do Sul. In length 150 m., its breadth varying between 20 m. and 40 m., it is the largest in the country and is separated from the Atlantic by a low, swampy strip of land. It

receives the waters of the Jacuhy and is connected with Lake Mirim (q.v.). Near its entry into the Atlantic is Rio Grande do Sul city, and at the N. end is Porto Alegre.

Lagomys (Gr. *lagōs*, hare; *mys*, mouse). Generic name of the pika, a rodent occurring in the U.S.S.R., Central Asia, and N. America. Known also as calling hares, they are about the size of a guinea-pig, and have short ears and no visible tail. The fur is soft and yellowish brown. They live among the rocks in cold districts, and feed upon herbage. As they do not hibernate, they accumulate large stores of food for the winter, when their burrows are covered with snow.

Lagoon (Lat. *lacuna*, pool). Shallow lake or sheet of water connected with a river or the sea. Usually found along the seaward margins of low-lying coastal plains, lagoons frequently occur in seas where the tides are small, e.g. the Baltic and Mediterranean. They are also found on a sand-dune coast like that of the Landes in S.W. France, and in large deltas like those of the Mississippi, Ganges, and Nile. The bars of sand or alluvium which cut off the lagoon from the sea are formed partly by tides and ocean currents and partly by rivers. Another type of lagoon is that enclosed by the ring of coral which makes an atoll or coral island. See Atoll; Coral Reef.

Lagos (anc. *Lacobraiga*). Seaport of Portugal, in the dist. of Faro. It is 20 m. N.E. of Cape St. Vincent and 12 m. W. of Portimão, and is the terminus of the rly. from Lisbon. A walled city, it has two forts, now dismantled, a harbour which affords shelter from N. and W. winds only, and an aqueduct. It exports figs and wine, and is a centre of the sardine and tunny fisheries. From this port, sent out by Henry the Navigator (q.v.), the first



Lagoon. The Sound, Great Bermuda, the coastal margin of which furnishes an example of a lagoon separated from the sea by low-lying wooded islands



Lagos, Portugal. Beffry and main entrance of the parish church

Portuguese ships sailed on voyages of discovery in Africa. An earthquake in 1755 destroyed much of the city. Pop. 9,443.

Lagos. Dist. of S. Nigeria. It extends from Dahomé towards the Niger so as to include all the Yoruba country with the exception of Norin, and to contain that portion of Nigeria known as "the Colony," i.e. the colony of Lagos, which was created in 1862 and,

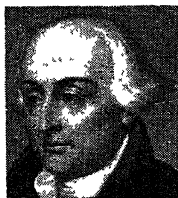
with its protected territories, was joined to the British protectorate of S. Nigeria, 1906. The natives are grouped in three main divisions: (1) Jejis or Effons, including natives of Dahomé, Porto Novo, etc.; (2) Yorubas; (3) Binis or Benins. The Yoruba-speaking race is by far the most important. Immigrant races are the Hausas and Fula. The province may be considered geographically in four zones: (1) Coastal lagoons, islands, and peninsulas; (2) flat, open country, with numerous swamps; (3) forest belt, about 40 m. wide, rising towards the watershed of the Niger; and (4) open country becoming hilly, and fertile and well watered. Area, of district, 28,600 sq. m.; of colony, 3,420 sq. m.

Lagos. Island and city in the Western prov. of Nigeria. The city is the principal seaport of the colony, and the seat of its central

government. It was bombarded and captured by the British in 1851, and incorporated in the British Empire ten years later. When after the entry of the Japanese into the Second Great War the seaways of the Indian Ocean were threatened, Lagos became of prime importance, its port forming a terminus of the trans-continental motor road and its aerodrome a vital link in airways to Cairo and the East. A rly. connects Iddo, on the mainland (which is joined by bridge to Lagos) with Kano in the N. of Nigeria, crossing the Niger at Jebba. Pop. 174,200. See Nigeria.

Lagos, BATTLE OF. Naval engagement between the British and the French, fought Aug. 18, 1759. A French fleet of 12 ships escaped from Toulon and made for the Portuguese coast, pursued by a British squadron under Boscawen. With four ships their admiral reached Lagos Bay; other vessels were destroyed, while five found refuge in Cadiz. Ignoring the neutrality of Portugal, Boscawen sailed after the four ships into Lagos Bay, where he captured two of them and destroyed the others.

Lagrange, JOSEPH LOUIS (1736-1813). A French mathematician. Born Jan. 25, 1736 at Turin, where he was educated, he early showed profound mathematical ability, astonishing Euler by his genius at the age of 19. Professor of mathematics at Turin, in 1764 he was awarded the prize of the French Academy of Sciences for his remarkable investigations into the libration of the moon, followed in 1766 by the no less remarkable investigation into the movements of the satellites of Jupiter. Then



J.L. Lagrange, French mathematician

he became director of the Berlin Academy for 20 years. He went to Paris in 1787, and was head of the commission which brought into existence the metric system. In 1788 he published his monumental work, *Mécanique Analytique*, which applied his principle of virtual velocities to all branches of dynamics, and in 1797 his *Théorie des Fonctions Analytiques*.

One of the mathematical geniuses of the century, Lagrange left his mark on every branch of the subject, e.g. the calculus of variations, theory of series and of numbers, the theory of equations, etc.; while he was no less noted for his power of analysis in astronomical problems. He was made a member of scientific societies, was created a count, a grand officer of the legion of honour, and awarded the chief prizes obtainable in mathematical research. He died April 10, 1813, and was buried in the Panthéon. His complete works were published in 14 vols. in Paris, 1866-92. See Astronomy. *Consult* Memoir, J. B. J. Delambre, 1876-77.

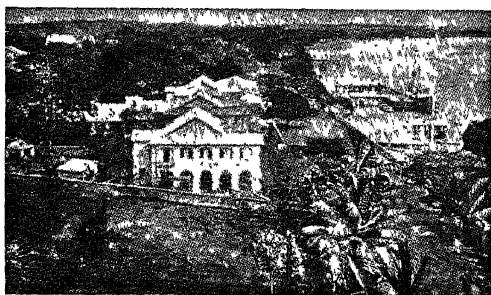
La Grita. Town of Venezuela, in the state of Táchira. It stands in a mountain valley, on the Grita river, 65 m. S.W. of Merida. The surrounding district is fertile, producing wheat, rice, sugar, tobacco, cocoa, and coffee. Founded in 1576, the town has on several occasions been damaged by earthquakes. The climate is agreeable.

La Guardia, FIORELLO (Ital., little flower) HENRY (1882-1947). An American politician. Born in N.Y. city, Dec.

11, 1882, he was educated at Prescott, Arizona, and at N.Y. university, where he graduated in law, 1910. In the consular service in Europe, 1901-04, he was interpreter at Ellis Island, 1904-06. During the First Great War he commanded the U.S. air force on the Italo-Austrian front, absenting himself from the house of representatives, of which he was a member 1917-19 and 1923-33. Nominally a Republican, he was elected mayor of New York city, 1933, as a "fusion" candidate, defeating both Democratic and Republican party machines; he was re-elected 1937 and 1941, the first man to occupy this post for three consecutive terms. During his mayoralty he



F.H. La Guardia American politician



Lagos, Nigeria. The sea front, from the tower of Christ Church

eliminated "boss" control from the mun. govt. In 1938, after the violent attacks upon Jews in Germany, he set Jewish policemen to guard German officials in New York. Chairman of the U.S. section of the Canada-U.S. permanent defence board from 1940, he was director of U.S. civilian defence 1941-42. He was director-general of U.N.R.R.A. from March 29 to Dec. 31, 1946, when the organization officially ended. He died in N.Y.C., Sept. 20, 1947.

La Guardia Field. Municipal airport of New York City, opened Dec. 2, 1939, and named in honour of F. La Guardia (v.s.). It occupies 558 acres in Long Island, and in 1947 claimed the heaviest air passenger traffic in the world with some 420 domestic and 18 inter-continental arrivals and departures daily. During the Second Great War it was the main home base of the U.S. army air transport command.

La Guayra. Chief seaport of Venezuela. One of the world's most beautiful harbours, with a magnificent breakwater, it stands on the Caribbean Sea, 9 m. direct and 23 m. by a winding mountain rly. N. of Carácas, of which it is the port. The climate is hot and unhealthy. The leading exports are cotton, sugar, coffee, cocoa, indigo, and hides, and the chief manufactures are tobacco, hats, and boots. Founded in 1588, La Guayra was blockaded by an Anglo-German fleet in 1903, pending settlement of claims against Venezuela. Pop. 21,000.

Laguna. Town of the Canary Islands. Towards the N.E. corner of Tenerife, it is a former capital of the Canaries, and is the seat of a bishop. Pop. 17,000.

La Harpe, JEAN FRANÇOIS DE (1739-1803). French critic. He was born in Paris, Nov. 20, 1739.



Jean de La Harpe,
French critic

His reputation rests on his 12 volumes of lectures, *Lycée, ou Cours de Littérature*, a comprehensive survey once regarded as a standard authority, though its critical methods and judgements are now obsolete. He also wrote mediocre tragedies, e.g., *Warwick*, 1763. At the first a warm adherent of the Revolution, he was alienated by its later excesses and finally became a supporter of church and throne. He died Feb. 11, 1803.

Lahej. Sultanate and town of Arabia, in the Aden protectorate. It is in the midst of a fertile plain, 18 m. N.W. of Aden, and its sultan is the premier chief of the protectorate. During the First Great War the town was captured by the Turks in July, 1915, and was recovered by the British in Dec., 1918, under the armistice terms.

Lahn. River of Germany, a tributary of the Rhine. It rises in the Rothaar Mts. in Hesse and flows E. and then S. to Giessen. Its lower course is S.W., and it enters the Rhine between Oberlahnstein and Niederlahnstein. About 140 m. long, it is navigable as far as Giessen, in the *Land of Hesse*, and its upper course flows through beautiful scenery. Other towns on its banks are Marburg and Weizlar. See Ems.

La Hogue, BATTLE OF. Naval engagements fought May 19, 1692, between the English and French. It takes its name from the old spelling of the place in the Cotentin Peninsula called La Hougue. It has sometimes been styled the battle of Barfleur, because much of the fighting took place off that eastern point of the peninsula.

The contending fleets were those of Admiral Russell, with whom were Vice-Admirals Delaval, Shovell, and Rooke, numbering in all 99 ships of the line, English and allied Dutch; and the French force commanded by the Comte de Tourville, which had 44 ships. Louis XIV, having espoused the cause of James II, had planned an expedition against England, and 20,000 troops ready to embark were encamped near La Hougue, under command of Marshal de Beaufonds. The French had taken no advantage of their success against Torrington off Beachy Head in 1690, and when Tourville was at sea in the following year with a considerable fleet, his orders forbade him to enter the Channel.

Louis was now all for action, and Tourville was forbidden to await reinforcements promising to double his strength. He was to attack the English forthwith, whatever their strength might be. The fleets were in sight of one another on May 19 off Cape Barfleur. Tourville had the wind, and made no hesitation in attacking the English centre, where nearly all the fighting took place. Russell hoped his van might be able to work W. and get round the French line, but there was not sufficient wind. The English fire was accurate, and Tourville's flagship, the *Soleil Royal*, was badly damaged. The

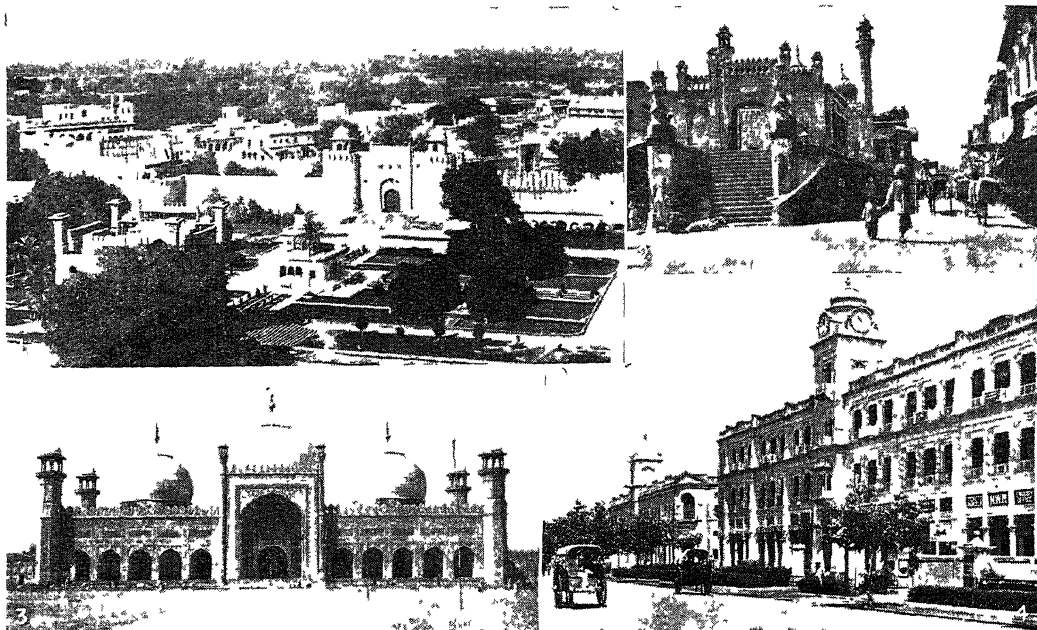
firing had begun at about 10 o'clock, and after five hours Tourville endeavoured to draw off W. in a fog, thinking he had done enough to carry out his orders. But the fog lifted and his movement was discovered.

In Russell's fleet were experienced seamen, who knew well the tides and half tides round the French coast. There being little wind, both fleets drifted with the tide, and anchored when it was against them. Some of the French ships weathered Cape de la Hague, the westernmost point of the peninsula, and reached St. Malo. The *Soleil Royal* and other ships were driven ashore by Delaval near Cherbourg and burned. Other French ships, which had not rounded Cape Barfleur, had taken refuge on the E. side of the peninsula, in the harbour of Saint Vaast de la Hougue, where on the 22nd and 23rd thirteen of them were burned by fireships conducted by Rooke. Thus England was saved from invasion.

Lahore. A division of Punjab, Pakistan. It is the smallest div. of the prov., and the most populous. Its area is 12,203 sq. m., nearly two-thirds of which is cultivated. Pop. 7,218,000.

Lahore. A district of Punjab, Pakistan. It surrounds the capital, in the Bari Doab, S.W. of Amritsar. Of the total area 60 p.c. is cultivated, chiefly for wheat and grain. The rainfall is slight, and three-quarters of the cultivated area depends upon irrigation water, mainly supplied by the Upper Bari Doab canal. Raiwind and Kasur are important trade centres and rly. junctions in addition to Lahore city. Its area is 2,595 sq. m. Pop. 1,695,375.

Lahore. The capital of Punjab, Pakistan. Lahore is identified as Labokla, mentioned by the geographer Ptolemy, and therefore dates from some time at the end of the 1st or the beginning of the 2nd cent. A.D. Its foundation is ascribed to a Rajput prince who later migrated from Lahore to Rajastan. The city rose to importance in the 8th and 9th cents. as the capital of a Brahmin dynasty, but it attained its greatest fame as the seat of the govt. of successive Muslim rulers, culminating with the Moguls, whose magnificent buildings still stand. Akbar held his court in Lahore, and the district of Anarkli derives its name from the lady of his harem who, as tradition has it, was buried alive for her love for his eldest son Salim, afterwards Jahangir.



Lahore, W. Punjab, Pakistan. 1. General view of the city. 2. Native bazaar bordering the Golden Mosque. 3. The Jama Masjid, or Great Mosque, built by the Mogul emperor, Aurungzeb. 4. The Mall, a modern business street

Jahangir himself built the palace at Lahore and often resided there. He is buried on the outskirts of the city at Shahdra in a tomb which is one of the most beautiful examples of Mogul architecture. His famous consort Nur Jahan (light of the world) is buried in a tomb close to the mausoleum of Jahangir. The great mosque at Lahore was built by Aurungzeb and it contains many sacred relics, including a hair of Mahomet. After the break-up of the Mogul empire Lahore declined; the Sikhs became its rulers in 1775, and under Ranjit Singh the city's splendour was partly restored.

Under British rule, which began in 1849, Lahore increased in importance as capital of the Punjab, the pop. (1941) being 671,659, 56 p.c. Muslims, 32 p.c. Hindus. The h.q. of the North-Western rly., longest system in India, Lahore has great industrial and strategic importance; shawls and carpets, gold and silver lace are the main products. The rly. workshops at Mogulpura, where rolling stock and railway equipment of all kinds are manufactured, are important. During the Second Great War these workshops made special contribution to the war effort.

With the partition of the Punjab between India and Pakistan in 1947, Lahore was the scene of serious disturbances, culminating in a period of utter lawlessness and wholesale massacre in Aug. Huge

numbers of Muslims migrating into Pakistan, and of Hindus and Sikhs into India, numbering 8,000,000 in all, passed through Lahore, where a divisional h.q. of both Indian and Pakistan armies was set up which gradually brought the situation under control.

At the military cantonment, about 8 m. away, Robert Montgomery disarmed three Sepoy regiments, and so saved the Punjab, during the mutiny in 1857. In memory of Montgomery and of John Lawrence, two halls were erected in 1866 and 1862 respectively in the Lawrence gardens. The Mayo school of arts with the central museum was once directed by the father of Rudyard Kipling, who himself started his career in Lahore on the staff of the Civil and Military Gazette, founded 1872. His vivid picture of Lahore by night is in *The City of Dreadful Night*, included in the book *Life's Handicap*.

The Punjab university was founded here in 1882, and the Archeson chiefs college in 1888 for the education of the sons of princes and chiefs. Lahore has an annual rainfall of about 20 ins. and it depends for irrigation on the Lower Bari Doab canal. It lies on the left bank of the Ravi, a tributary of the Indus.

Laibach. Historic name of the town of Yugoslavia now known as Ljubljana (*q.v.*). The congress of Laibach was a conference of repre-

sentatives of European powers held Jan.-May, 1821. Really a continuation of the congress of Troppau, it was concerned primarily with the question of intervention in the kingdom of Naples, where recent events were regarded by Austria as a menace to peace. Russia and Austria were for joint action; Prussia supported this, but Great Britain and France opposed. At length the congress sanctioned the Austrian occupation of Naples, and so marked the end of the concert of Europe established in 1815.

Laidlaw, DANIEL. Scottish soldier. He served with the King's Own Scottish Borderers as a piper



Daniel Laidlaw, British soldier
Russell

on the Indian frontier, 1897-98. In the First Great War he was with the 7th battalion, and won the V.C. at the battle of Loos, Sept. 25, 1915. During a German bombardment he marched up and down the parapet and played his company out of the trench to the assault, continuing until wounded

Laidlaw, William (1780–1845). Scottish farmer-poet. He was born at Blackhouse, among the braes of

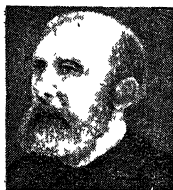


William Laidlaw,
Scottish farmer-poet
After Sir W. Allan, R.A.

Yarrow, Selkirkshire, Nov. 19, 1780. Here Hogg, the Ettrick Shepherd, worked and in 1801 the two helped Scott with material for his *Border Minstrelsy*. In 1817 Laidlaw became steward at Abbotsford, and in 1819, with Ballantyne, took down from dictation three of the *Waverley* novels. The theme of St. Ronan's Well is said to have been suggested by him. He became Scott's amanuensis and fulfilled the duties of this post until 1832. Laidlaw, who died at Colinton, Dingwall, May 18, 1845, is remembered as the author of the lyric, *Lucy's Flittin'*, first printed in Hogg's *Minstrelsy*, 1810.

Laing, David (1793–1878). A Scottish antiquary. Born in Edinburgh, April 20, 1793, and apprenticed to his father, he travelled abroad in quest of rare books. He was secretary of the Bannatyne Club, 1823–26, and librarian of the Signet Library, 1837. He died Dunbar, 1834; Robert Baillie, 1841–42; Knox, 1846–64; Henryson, 1865; leaving his *Wyntoun* and *Lyndsay* incomplete. From 1822 he edited early Scottish ballads and metrical tales. He bequeathed his MSS. to the university of Edinburgh, where he died Oct. 18, 1878.

Laing, Samuel (1810–97). British politician. Born in Edinburgh, Dec. 12, 1810, he was educated at S. John's College, Cambridge, and became a fellow and a barrister. The post of private secretary to the president of the board of trade led to his appointment as



Samuel Laing,
British politician

secretary to its railway department, 1842–47. During 1848–55 he

was managing director of the L.B. & S.C. rly. In 1852 Laing entered parliament as Liberal M.P. for Wick; in 1859 he was financial secretary to the treasury; and in 1860 he went to India as finance member of the viceroy's council. Again an M.P., 1865–85, he was chairman of the L.B. & S.C. rly., 1867–94, and died Aug. 6, 1897. Laing wrote *Modern Science and Modern Thought*, 1885; *The Antiquity of Man*, 1890; *Human Origins*, 1892.

Laing's Nek. Name sometimes given to the pass in the Drakensberg, S. Africa, which is more correctly called Lang's Nek (*q.v.*).

Laird. The Scottish term for a squire or a lord of the manor. Originally the term was applied only to a tenant-in-chief of the Scottish crown.

Laird, John (1805–74). British shipbuilder. Born at Greenock, he joined his father's firm of shipbuilders at Birkenhead, which under his management was in 1829 one of the first to use iron for shipbuilding. Several of the earliest iron vessels were built in its yard. Laird was Conservative M.P. for Birkenhead from 1861 till his death, Oct. 29, 1874. His sons continued the business as Laird Bros. His brother, Macgregor Laird (1808–61), left the business to take part in an expedition to Africa, where he set up missions and schools for natives.

Laird, John (1887–1946). Scottish philosopher. Born at Durriss, May 17, 1887, he was educated at Edinburgh and Heidelberg univs. and Trinity College, Cambridge. He occupied the chair of philosophy at Dalhousie university in 1912; that of logic and metaphysics at Belfast, 1913–24; was lecturer at California university, 1923; and professor of moral philosophy at Aberdeen from 1924. Among his books are *Problems of Self*, 1917; *The Idea of the Soul*, 1924; *Modern Problems in Philosophy*, 1928; *Morals and Western Religion*, 1931; *Mind and Deity*, 1941; *The Device of Government*, 1944. He died Aug. 5, 1946.

Lais. The name of two famous Greek courtesans. The elder, a native of Corinth, lived in the 5th century B.C. The most beautiful and one of the most vicious women of her time, she numbered

among her admirers the philosopher Aristippus and Diogenes the Cynic. The younger, who lived a century later, was born at Hycara, in Sicily, and afterwards removed to Corinth. She is said to have accompanied one of her admirers to Thessaly, and to have been slain there by some jealous women. *Pron. Lay-iss.*

Laissez Faire. French term meaning colloquially let it alone. Its main use is in economics, where it refers to the teaching of those who advocate unrestricted competition, or the minimum of interference with industry. The term is said to have originated about 1680. The theory developed in Great Britain in the 18th century, and was strengthened in the 19th; by 1846 its friends had won a number of victories, which culminated in the repeal of the corn laws. About 1848–80 the doctrine was dominant in the country. The whole tendency of modern life is in the opposite direction. *See Free Trade. Pron. Laysay fair.*

Laity. Term used for those who are not clergymen. *See also House of Laity.*

Laius. In Greek legend, king of Thebes and father of Oedipus, by whom, true to the prediction of an oracle, he was unwittingly killed. *See Oedipus. Pron. Lay-us.*

Lajpat Rai, Lala (1856–1928). Indian politician. Born at Jagron, Punjab, he was educated at Government College, Lahore, and became a lawyer. One of the first members of the Indian national congress to advocate a complete break with all British parties, he was deported to Mandalay for agitation in 1907, but was allowed to return and disseminate his ideas in vernacular journals. In the U.S.A., 1917, he published *Young India*; he returned home in 1920. President of the session of congress which originated the campaign of non-cooperation, he was imprisoned, 1921–23, and later, proving more amenable to British influence, represented Indian trade unions at the labour conference at Geneva, 1926. He was mainly responsible for the boycott of the Simon commission, 1928. That year he published *Unhappy India*, a reply to Kathleen Mayo's *Mother India*.

Lake. Sheet of water occupying a depression in the earth's surface. Lakes are temporary features geologically; their surface levels are being continually lowered by erosion of the beds of rivers that drain them; deltas formed by inflowing streams, and deposition



John Laird,
British shipbuilder



Laing

of sediments in the lake basin and around its margins, tend to fill them up. Old lake basins are economically important: in mountainous districts they form flat areas of agricultural land; they may carry extensive peat deposits; and locally diatomaceous earth, low grade iron ore, salt, and gypsum may occur in them. Lakes are of great service in checking sudden floods on rivers, and with suitable conditions can be converted into storage reservoirs for domestic water, irrigation, or hydro-electric power installations.

Lakes are classified according to their mode of formation: (1) youthful lakes, caused by the flooding of depressions on a newly formed surface where drainage has not become established; (2) structural or tectonic lakes in rift valleys, *e.g.* the Dead Sea, Lake Nyasa, or in basins due to earth movements; (3) volcanic or crater lakes (*see* Caldera; Crater Lake); (4) ox-bow lakes, formed by the cutting off of river meanders; (5) drift lakes which occupy hollows in glacial drift deposits; (6) rock basins, *e.g.* corrie-lakes and tarns (larger varieties of the type are often elongated and follow structural lines of weakness in the crust, such as fault lines, where the rock was more easily scraped away; they are commonly dammed by glacial drift or old moraines, as at Windermere and Lake Garda); (7) barrier lakes developed in river valleys by accidental damming, as when a delta or alluvial cone is formed by outwash from streams, lava flows, landslides, etc.

A particular instance of (7) is a lake formed by a glacier advancing across the main valley and damming the river Shyok in the Himalayas. Barrier lakes may also be impounded by the development of spits, bars, or sand dunes cutting off a part of the sea. These are commonly salty or brackish. Inland salt lakes are usually in hot regions where evaporation takes the place of an outflowing river. This causes concentration of the mineral salts in the lake water, and eventually their precipitation with the production of saline deposits.

Lake. An insoluble pigment formed by precipitating a dyestuff. With an acid dyestuff a metallic salt is used, *e.g.* alum or barium chloride, the corresponding metallic compound of the dye forming the lake. Basic dye-stuffs, *e.g.* methyl violet, are precipitated with tannic or phosphoric acid.

Originally the term lake was applied to compounds formed from

natural dyes. Those from madder (red), woad (blue), weld (yellow), and murex, a shell-fish yielding the famous royal purple, were most important. The Egyptians used madder and a vegetable yellow dye; murex was known in Roman times. The precipitant in those early times was lime associated with gypsum or chalk. The use of absorbent earths like kaolin, which could be stained by dyestuffs, was also understood. Pliny (c. A.D. 60) mentions aluminium salts as precipitants. By the 13th century a great variety of natural dyes forming lakes was known and methods of their preparation were similar in principle to those used today.

The development of synthetic dyes begins with Perkin's mauveine from aniline (1856). In 1868 alizarin—the colouring principle of madder—was synthesised from anthracene obtained from coal-tar. Since then the variety of synthetic dyestuffs yielding lakes has increased. There has been a corresponding advance in the methods of lake manufacture, with the result that lake pigments of almost any shade and degree of permanence can be obtained and the natural dyestuffs have been virtually eliminated. *See* Dyes and Dyestuffs; Pigments.

Lake, GERARD LAKE, 1ST VISCOUNT (1744–1808). British soldier. Born July 27, 1744, he entered the



1st Viscount Lake,
British soldier

foot guards in 1758. He served in Germany during the Seven Years' War, and in America during the War of Independence. In 1793 he was in command of the brigade of guards in Flanders, being responsible for the victory of Lincelles, but he is better known as the commander-in-chief in Ireland during the rising of 1798. He routed the rebels at Vinegar Hill and forced their French allies to surrender at Ballinamuck. In 1801 Lake was made commander-in-chief in India, and there remained until 1805, being responsible with Sir Arthur Wellesley for crushing the Marathas in several battles, of which Laswari was the chief. In 1804 he was made a baron and in 1807 a viscount. From 1790 to 1802 he was M.P. for Aylesbury, and he was for a time a member of the Irish house of commons. He died Feb. 20, 1808.

Lake Charles. City of Louisiana, U.S.A. It is a deep water port situated on the Calcasieu river, lies 216 m. W. of New Orleans, and is served by railways. It has important lumber and rice industries, rly. car shops, and wool trade. The neighbourhood produces petroleum, sulphur, and pine wood. Lake Charles was settled in 1850, incorporated in 1857, and became a city in 1886. Pop. 21,207 (one third negro).

Lake City. A city of Florida, U.S.A., the co. seat of Columbia county. Situated in a much-visited lake dist., it is 60 m. W.S.W. of Jacksonville and is served by the Seaboard Air Line and other rlys. It is the seat of Columbia College. There is trade in cotton, fruit, tobacco, phosphates, turpentine, and other local products. Settled and called Alligator in 1826, the place was incorporated in 1854, received its present name five years later, and was reincorporated with an extended area in 1901. Pop. 5,836.

Lake Copper. Name commonly used to describe the refined copper produced at Lake Superior. The ores in that area yield high-grade copper, often purer than electrolytically refined copper, and so in great demand. Although the deeper deposits now in use are not so pure and the metal must sometimes be electrolytically refined, it retains its reputation.

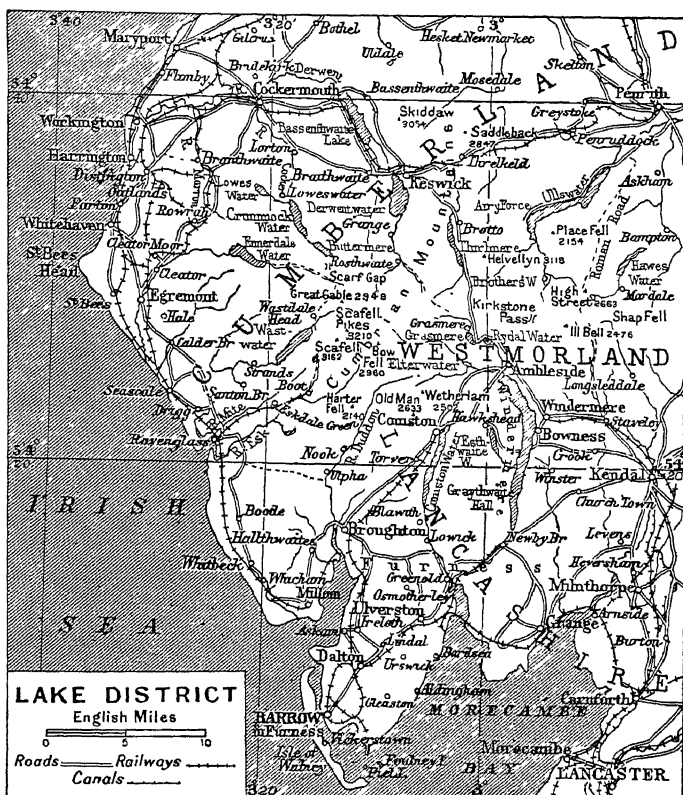
Lake District. Name given to the picturesque region and mountains, lakes, streams, and waterfalls in Cumberland, Westmorland, and part of Lancashire, England. The lakes are Windermere, Ullswater, Conistone, Bassenthwaite, Derwentwater, Wastwater, Thirlmere, Crummock Water, Ennerdale Water, Hawes Water, Esthwaite Water, Lowes Water, Buttermere, Grasmere, Rydal Water, Brothers' Water, and Elterwater. Of the mts. the highest are Scafell Pike, 3,210 ft.; Scafell, 3,162 ft.; Helvellyn, 3,118 ft.; and Skiddaw, 3,054 ft. There are many passes ranging from 780 ft. to 2,490 ft. Thirlmere, the level of which has been raised 50 ft. by a dam, is the chief source of the water supply of Manchester, with which it is connected by an aqueduct about 95 m. long. Hawes Water has been similarly acquired for the Manchester water supply.

The district has long been a favourite resort of tourists, walkers, and climbers. Its popularity is due to Wordsworth, though Gray had drawn attention to its beauties. Wordsworth's Sonnets to the

Duddon made the Duddon Valley especially famous. Other beauty spots include Keswick near the confluence of the Greta and the Derwent, the home of Cole ridge and Southey; Coniston, at the foot of Coniston Old Man, 2,633 ft., where are Ruskin's grave and the Ruskin museum. Bowness, on the E. shore of Windermere, a place of call for the lake steamers. Ambleside, near the head of Lake Windermere, and Grasmere the home of Wordsworth and De Quincey. The area of the dist., the rainiest in England, is about 35 sq. m. There is a good deal of rock climbing, and several packs of foxhounds, which are followed on foot, hunt the district. The dome-shaped upland of the Cumbrian Mts. is joined to the Pennines at Shap Fell; it is glaciated and composed of old rocks. Sir H. Walpole's *Herries Chronicle* gives the chief portrayal in fiction of the district. See Cumberland; Westmorland.

Bibliography. Sketch of a Tour Round the Principal Lakes in Lancashire, Cumberland, and Westmorland, T. Gray, 1803; A Guide through the District of the Lakes, W. Wordsworth, 5th ed. 1835; English Lake District, W. A. Knight, 1878; The Vertebrate Fauna of Lakeland, H. A. Macpherson, 1892; Highways and Byways in the Lake District, A. G. Bradley, 1901; Literary Associations of the English Lakes, H. D. Rawnsley, 1901; The Lake Counties (birds, butterflies, etc.), W. G. Collingwood, 1902; Round the Lake District, H. D. Rawnsley, 1909; Lakeland Journey, W. A. Poucher, 1945; Wanderings in Lakeland, W. Palmer, 1945; Lake District and National Trust, B. L. Thompson, 1946; Companion Into Lakeland, M. Fraser, 5th ed. 1947.

Lake-Dwelling OR PALAFITTE. Habitation upon a pile-supported platform. They are found on shallow lake-margins, especially along



Lake District. Map of portions of Cumberland, Westmorland, and Lancashire, showing the position of the English lakes

the Alpine axis of Europe. Of the neolithic and early metallic ages, they are best preserved in Switzerland and N. Italy. They were perhaps brought W. by pastoral Alpine roundheads, and characterise the later Stone Age in E. Switzerland, as at Constance and Zürich. Wengen, on Constance, stood on 50,000 piles; mid-neolithic Robenhause, on Lake Pfäffikon, on 100,000. As bronze spread gradually westward

longer piles, farther from the shore, were introduced—at Moeringen, 600 ft. away; at Morgues, 1,200 ft. This Bronze-Age culture radiated to Savoy, e.g. Annecy and Bourget, and N. Italy, e.g. Garda and Varese.

The submerged piles supported platforms above water level, bearing 200 to 300 round or oblong huts, with thatched roofs, clay floors, and stone hearths. They were approached by pile-bridges or dug-out canoes, whereof one 43 ft. long is preserved. Some villages specialised in axe-making, pottery, bronze-smelting, and the like. Of 70 animals identified, the dog, pig, goat, sheep, ox, and horse were domesticated. Cattle were sometimes stalled on the palafittes; cheese was made, bridge bits and wagon wheels mark the beginnings of horse transport. Among 115 plants many were cultivated, including wheat, millet, barley, beans, vine, and apple. Bread was baked; grain and soft fruits were stored for winter. Fish were hooked and netted. Flax was spun and woven, or twisted into cordage. Much use was made of bone implements and rough pottery. This long-continued lacustrine civilization, although uniform with



Lake-Dwelling. Pile-built village of Parajano Indians in the lagoon of Simunauca, Venezuela. From such dwellings the early discoverers called the country Venezuela of Little Venice

that of the contemporary land-dwellers of primitive Europe, disappeared in early historic times, doubtless under the pressure of immigrant iron-using peoples. *See* Bronze Age; Glastonbury; La Tène; Pile Dwelling; Stone Age.

Bibliography. Lake Dwellings, F. Keller, Eng. trans. J. E. Lee, 2nd ed. 1878; The Lake Dwellings of Europe, R. Munro, 1890; Prehistoric Times, Lord Avebury, 7th ed. 1913.

Lakehurst. United States naval air base in Ocean co., New Jersey. Established as a balloon experimental centre in the First Great War, it later became the western terminal for trans-Atlantic airship services. Here the German airship Hindenburg (*q.v.*) was destroyed by fire as she was making contact with the mooring mast on May 6, 1937. In the Second Great War, Lakehurst was the operational base for U.S. Navy semi-rigid airships engaged in the Atlantic anti-submarine patrols. It has workshops and mooring facilities, used by civil airships operating American internal services.

Lake of the Woods. Lake of N. America. Its area is 1,850 sq. m. and its length 70 m. The Rainy river flows into it, and the Winnipeg river carries its waters to Lake Winnipeg. It is studded with islands. Kenora, at the N. outlet, is the centre for steamer traffic on the lake, which lay on the historic portage route to the W. The boundary between Canada and the U.S.A. crosses the lake so as to leave Big Island in Canada; most of the Canadian portion is in Ontario, the American portion is in Minnesota.

Lake School of Poets. *THE.* Term applied derisively by The Edinburgh Review and by Byron to Wordsworth, Coleridge, and Southey, who for varying periods made the English Lake District their home. The term, as De Quincey pointed out, was absurd, in that these three poets did not form a school except in so far as each of them had his part in the general reaction against 18th cent. formality; they are better described as the Lake Poets. *See* English Language and Literature.

Lake Success. Suburb of New York City, in Nassau co., Long Island, N.Y. Here, from Sept., 1946, the secretariat of the United Nations was housed in a former factory pending the construction of permanent h.q. in N.Y.C. The term Lake Success came to be used as a synonym for the U.N.

Lakh OR **LAC.** Hindu word for one hundred thousand. It is

chiefly used for 100,000 rupees. A hundred lakhs is called a crore.

Lakhimpur. District of India, in the N.E. of Assam. It lies between Tibet and Burma, and is drained by the Brahmaputra river, which here enters India, and its tributaries, of which the chief here is the Lohit. Although four-fifths of the area is cultivable, only an eighth is tilled, chiefly for rice and tea. The average rainfall is 220 inches annually. Sadiya and Dibrugarh, the chief towns, are centres of river traffic. The labourers on the tea plantations are mainly immigrants from Chota Nagpur. Area, 4,156 sq. m. Pop. 894,842.

Laki Fissure. Volcanic eruption in Iceland in 1783, when some 3 cu. m. of lava covering about 220 sq. m. of country were poured out from a narrow fissure 20 m. long. The latter represented the top of a dyke which had reached the surface.

Lakshmi. In Hindu mythology, the goddess of wealth, beauty, and fortune, and wife of Vishnu. She is



Lakshmi. In Hindu mythology, wife of Brahma and goddess of good fortune

supposed to have sprung from the froth of the ocean when it was churned by gods and demons, and is one of the gods still generally worshipped, her figure being frequently met with in the houses of Hindu shopkeepers. She was the mother of Kama, the god of love, and this, with her oceanic origin, suggests an eastern parallel with Aphrodite. *See* Hinduism.

Lalande, JOSEPH JÉRÔME LE FRANÇAIS DE (1732-1807). French astronomer. Born at Bourg-en-Bresse, July 11, 1732, he studied law, but, showing an aptitude for mathematics and astronomy, he was sent in 1751 to Berlin, where he determined the moon's parallax. In 1753 he became a member of

the Paris Academy, in 1761 was appointed professor of astronomy



J. J. de Lalande, French astronomer

in the Collège de France, and in 1795 director of the Paris Observatory. He wrote popular treatises on astronomy, notably *Traité d'Astronomie*, 1764, and in 1802 appeared

his great work, *Histoire Céleste Française*, containing a catalogue of over 47,000 stars. He founded the annual Prix Lalande in 1802 for the most useful treatise on, or research in, astronomy. He died in Paris, April 4, 1807.

Lalang OR **ILANG-ILANG.** Broad-bladed variety of grass found in Malaya. The grass, which grows over large areas of waste land, has been experimented with as a source of paper pulp.

Laleham. Village of Middlesex, England. At the S.W. edge of the co., it is on the Thames, 2 m. S.E. of Staines. Matthew Arnold was born here and is buried in the churchyard, which is commemorated by William Watson's lines on the poet. The Middlesex bank of the Thames at Laleham is a popular resort for swimmers and picnic parties. The nave of the church contains Norman work. Between Laleham and Littleton is the Queen Mary reservoir which when opened in 1925 was the world's biggest artificial water supply.

La Libertad. A seaport of Ecuador, in Guayas prov. It is connected by rly. with Guayaquil, 60 m. E., and by rly. and pipe line with Ancon and the oilfields.

La Libertad. Seaport of Salvador. In the dept. of La Libertad, 16 m. S. of Nueva San Salvador. It exports coffee, rice, indigo, sugar, and timber. Disembarking is by lighter. Pop. 3,500.

Lalín. Town of Spain, in the prov. of Pontevedra. It stands in the midst of an agricultural dist., 50 m. by road S. of Corunna, and N.E. of Vigo. Tanning and paper making are industries. Near by is the ruined abbey of Carboiro. Pop. 18,500.

Lalique, RENÉ (1860-1945). A French designer. Born at Ay, Marne, April 6, 1860, he became a designer of small ornaments, but after the Paris exhibition of 1900 devoted himself to glass. He applied his work to all resources of production, but borrowed his decorative motifs from nature—using birds, fish, deer, and flowers.

His table glass became world-famous, and he was a leading designer in all glassware of delicate colour. He died May 9, 1945.

Lalitpur. District and town of India, in the Uttar union, in the Jhansi div. The dist. is part of the hill country of Bundelkhand, drained by the torrents of the Vindhya Mts. The rapid drainage leaves the rock bare, so that alluvial deposits are infrequent and cultivation is backward. Wheat, grain, millet, and pulses are grown. The population is steadily declining. The town is 60 m. S. of Jhansi on the main road and rly. The area is 1,057 sq. m. Pop., dist., 178,586; town, 16,881.

Lalla Rookh: AN ORIENTAL ROMANCE. Title of a poetical work by Thomas Moore, first published in 1817. It consists of several poems connected by a prose narrative of the journey of Lalla Rookh, daughter of Aurungzebe, to meet her betrothed, the king of Bucharia. The last-named sends Feramorz, a young Cashmerian poet, to beguile the journey. Lalla Rookh falls in love with the young poet, to find, on reaching Cashmere, that her betrothed and Feramorz are one and the same. The criticisms by Fadladeen, the Grand Chamberlain, of the poems recited by Feramorz, form a skit at the expense of Francis Jeffrey, who retorted by an amusing description, in *The Edinburgh Review*, of Moore's narrative style. The work resulted from an understanding by which Moore was to receive from Longmans £3,000 for a poem as long as Scott's *Rokeby*.

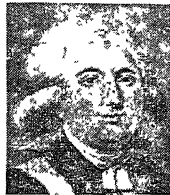
L'Allegro. Lyric poem by John Milton addressed to gaiety. It is the companion in form and contrast in theme to his *Il Penseroso*.

Lally, THOMAS ARTHUR (1702-66). French soldier. Born at Romans, Dauphiné, in Jan., 1702, he was the son of an Irish father and a French mother. His father, Sir Gerard Lally, had left Ireland because of his adherence to the cause of James II, and the son entered the French army in 1721. He soon made his name, and rose to command the regiment de Lally, which he led at Fontenoy. He served in the Jacobite expedition of 1745-46, and in the various wars waged by France against the house of Austria.

In 1758 Lally was sent at the head of an expedition to India, and he took Fort St. David from the British. However, he was beaten back from Madras, his troops were crushed at Wandiwash, and finally he was forced to surrender Pondicherry in 1761.

His misfortunes were partly due to his arrogance and a want of consideration in dealing with his men. From England, as a prisoner of war, he went on parole to France, where he was charged with treachery and cowardice. After a long imprisonment he was tried and found guilty, and on May 9, 1766, was beheaded. Lally inherited from his mother the titles of count of Lally and baron of Tollendal; he is sometimes known as Lally-Tollendal. See *The Career of Count Lally*, G. B. Malleson, 1865.

Lally-Tollendal, TROPHIME GÉRARD, MARQUIS DE (1751-1830). French politician. Born in Paris,



Marquis de Lally-Tollendal, French politician

March 5, 1751, son of Thomas Arthur Lally, his early years were spent in efforts to prove his father's innocence and recover his estates. Here represented the noblesse of Paris in the States-General, 1789, but resigned from the Constituent Assembly. In 1792 he fled to England, returning under the Consulate, having meanwhile published a defence of Louis XVI, 1793, and of the French émigrés, 1796. He became a trusted councillor of Louis XVIII, whom he attended during the Hundred Days, and died in Paris, March 11, 1830.

Lamaism. Religious system of Tibet and Mongolia. Found also in Sikkim and Bhutan, and named after the Tibetan word *lama*, Superior One, given to its priests and monks, it constitutes the civil as well as the religious government of Tibet. Its elaborate hierarchy has as its head the Grand or Dalai Lama, whose spirit is supposed to be reborn in a child, the child being found by oracular signs, and tutored by a regent until the age of 18. The Vatican of Lamaism is a palace on Mt. Potala, near Lhasa (*q.v.*). The headship is shared by the Pen-Ch'en Grand Lama of the monastery of Tashi-lhunpo, who is less concerned with temporal matters than his brother of Lhasa. In Tibet every family devotes at least one of its sons to the church. There are gorgeous cathedrals, huge monasteries, and nunneries; and a ritual resembling outwardly that of Roman Catholicism.

At one time the religion of Tibet was the Bön-pa, an animistic and devil-dancing religion resembling Taoism (*q.v.*). In the 7th century, Buddhism was introduced by King Sron Tsan Gampo, the Tibetan

Constantine. But it was a Buddhism affected by Tantrism or Sivaic mysticism; and about 747 Guru Padma-Sambhava adapted it to the demonolatrous Bön-pa. Lamaism has had two great reformers, Atisa or Aṭisha, in the 11th century, and Tson-Kapa, in the 15th century. In the 13th century Kublai Khan made it a state religion, by promoting the abbot of the Sakya monastery to the position of a tributary sovereign, and being by him crowned emperor of the Mongol empire. The sect formed by Atisa was wholly reorganized by Tson-Kapa, and this sect, which in five generations obtained the priest-kingship of Tibet, is known as that of the Yellow Hats; the old Lamaist body being distinguished by the title of Red Hats and their more aboriginal co-religionists as Black Hats, all so named from the colour of their hoods or other headgear.

While in the higher ranks of the Lamas are found exponents of the loftier philosophy and ethics taught by Gautama Buddha, the founder of Buddhism, priests and people are steeped in superstition and idolatry. After the "Buddhas" and Bodhisats, those who, as incarnations of saints, are believed to have qualified themselves for the state in which reincarnation ceases, are the tutelary deities of the Lamaic pantheon, malignant sprites with limited powers, imps who ride on fox-back at night, etc. It is part of the duties of a lama to instruct the traveller as to the deity to be worshipped or invoked by him at the entrance to each village or district.

The lamas themselves are under the supreme dread of the form of their reincarnation, hence they kill no living thing; for them punishment in this form is only to be obviated by strict adherence to rites and ceremonies. Lamaism teaches that a man who is physically deficient has deserved his punishment by his behaviour in a previous life. Notable minor features of Lamaism, apart from its elaborate ceremonial and devil-dancing, are its praying wheels, prayer flags, amulets, and charms. See *Buddhism*; *Tibet*; consult *The Buddhism of Tibet*, L. A. Waddell, 1895; *Lhasa*, P. Landon, 1906; *Tibet Past and Present*, C. Bell, 1924; *Iconography of Tibetan Lamaism*, A. K. Gordon, 1939.

La Mancha (Arab. *mansha*, dry, desert-land). District of Central Spain. It is an arid plateau, stretching from Ciudad Real prov. through Albacete and Toledo to Cuenca. Noted for its mules and wine (see *Val de Peñas*, the valley

of stones), it is more famous as the scene of Don Quixote's exploits. La Mancha is thickly sprinkled with the curious small windmills (8 ft to 10 ft high) which so deluded the knight.

Lamarck, JEAN BAPTISTE **PIERRE ANTOINE MONNET, CHEVALIER DE** (1744-1829) French zoologist. Born Aug 1, 1744, at Bazentin le Petit, in Picardy, he was intended for the Church. His father dying when he was 16, Lamarck enlisted, and for bravery during the Seven Years' War was promoted to lieutenant. An acci-

dent caused him to throw up his military career, and, taking an interest in medicine and botany, he began studying in Paris. In 1778 he published his first great work, *Flore Française*, 3 vols, being elected to the French Academy of Sciences in 1779. In 1781 he travelled on the Continent to study botany and was in 1788 appointed keeper of the herbarium of the Royal Garden, now better known as the Jardin des Plantes. He carried through the reorganization of the Museum of Natural

History, at which he was appointed to be the chair of invertebrate zoology in 1793. In 1801 he published his *Système des Animaux sans Vertèbres*, in 1809 *Philosophie Zoologique*, and in 1815-22 his *Histoire des Animaux sans Vertèbres*, 7 vols. He died in Paris Dec 18, 1829, blind and in poverty.



J. B. de Lamarck
French zoologist

Lamarck was the greatest zoologist of his time, ranking with Linnaeus and Cuvier. With the latter's hypothesis of the sudden creation or extinction of species, however, he strongly dis-

agreed advocating the descent of living animals from forms found as fossils. He gave his name to Lamarckism, which claims that peculiarities acquired from environment during life by an individual are transmitted to later generations. His doctrines are propounded in *Philosophie Zoologique*, and *Animaux sans Vertèbres*. Though they are closely allied to those of Darwin, and represented an immense advance on previous thought, he failed to make Darwin's fundamental discovery of natural selection to account for variation. He was nevertheless the founder of invertebrate palaeontology, was one of the great reformers in the classification of animals, and a man who thought on bold, broad epoch-making lines. See Zoology, consult also Darwinism and Lamarckism, F. W. Hutton, 1899, Lamarck, the Founder of Evolution. His Life and Work, with Translations of his Writings, A. S. Peckard, 1901.



dent caused him to throw up his military career, and, taking an interest in medicine and botany, he began studying in Paris. In 1778 he published his first great work, *Flore Française*, 3 vols, being elected to the French Academy of Sciences in 1779. In 1781 he travelled on the Continent to study botany and was in 1788 appointed keeper of the herbarium of the Royal Garden, now better known as the Jardin des Plantes. He carried through the reorganization of the Museum of Natural



Lamaism. Dresses worn by devotees of the religion of Tibet. 1 Group of nuns, one in the centre is holding a prayer-wheel. 2 Devil dancers in their hideous masks. 3 Lamas of the Chatra monastery with telescopic trumpets, 16 ft long. 4 Devil dancer's costume and mask. 5 Lamas of Nud in ceremonial dress.

Lamartine, ALPHONSE MARIE
LOUIS DE PRAT DE (1790-1869)
French poet, historian, and poli-



tician Born at Mâcon, Oct 21, 1790, he was educated at Milly, Lyons and at Belley When 21 he was sent to Italy, and at

Naples met a young cigarette maker,

whom he idealised as Graziella, 1852 He served as an officer of the royal bodyguard, and met Mme Charles, the Elvina of Le Lac and the Julia of Raphael, 1849 His Méditations Poétiques, 1820, struck the first note of the new French romantic poetry

In 1822 he married an English lady, Marianne Bruch, and became secretary in the French legations at Naples and Florence In 1823 came Nouvelles Méditations, and Mort de Socrate, in 1825, Le Dernier Chant du Pèlerinage d'Harold, in 1827, Harmonies Poétiques et Religieuses He was elected to the Academy in 1829 In 1832, with his wife, he went on an extended tour of the East, described in his Voyage en Orient, 1835 On returning to France he was elected to the chamber as an independent He then wrote Jocelyn, a narrative poem One of five members chosen as an executive committee at the Revolution of 1848, he found that the popularity of his recently published Histoire des Girondins secured for him something like a dictatorship He abolished the death penalty, but this and other examples of moderation, together with his self effacement, deprived him of influence, and he retired He failed to secure election later to the assembly and, left a poor man, had to take up hack work for the publishers A grant of £20,000 from the Empire government saved him from poverty before he died in Paris, May 1, 1869 In addition to the works named, Lamartine wrote La Chute d'un Ange, 1838, Recueils Poétiques, 1839, Histoire de la Révolution de 1848, 1849, Confidences, 1849, Nouvelles Confidences, 1851, Histoire de la Restauration, 1851-52 As a poet, he has been called the French Cowper, his work is melodious, gentle, lacking variety It represents a notable reaction against the materialism prevalent in his time

Bibliography Oeuvres Complètes 40 vols 1860-66 Souvenirs sur Lamartine C Alexandre 1884 Lives Lady Dornville, 1888 E Deschanel, 1893 R Doumic 1912, H R Whitehouse, 1918, L and Romantic Unanimism, George 1940

Lamas, CARLO DE SAAVEDRA
For an account of this Argentine statesman and Nobel peace prize winner, 1936, see Saavedra

Lamb, LADY CAROLINE (1785-1828) British novelist Daughter of the 3rd earl of Bessborough, and niece of Georgiana, duchess of Devonshire she was born Nov 13, 1785 Married in 1805 to William Lamb, the future Lord Melbourne (q.v.), she became infatuated with Byron about 1812-13, and embarrassed him with fits of deep melancholy and violent temper Her novel Glenarvon, published anonymously in 1816, contained a bitter pen portrait of Byron She separated from her husband in 1824, and died Jan 26, 1828 A study by E Jenkins appeared in 1932

Lamb, CHARLES (1775-1834)
English essayist, famous under his pseudonym of Elia (pron Elia)



Charles Lamb

From the engraving by Henry Mayer

Born at 2, Crown Office Row, London, Feb 10, 1775, he was the youngest of a large family of whom only two others grew up, John (1763-1821) and Mary, (1764-1847) His early surroundings are described in several of his essays, Old Benchers of the Inner Temple, My Relations, and Mackery End in Hertfordshire At Christ's Hospital, 1782-89, Lamb began his friendship with Coleridge His memories of school are given in Recollections of Christ's Hospital, and Christ's Hospital Five and Thirty Years Ago Lamb entered a City merchant's office, and in the autumn

of 1791 was appointed to a clerkship in the South Sea House In 1792 he was transferred to East India House, where he remained for 33 years

There was insanity in the family, and, writing in 1796 to a friend, Lamb said that he had passed "the six weeks that finished last year and began this very agreeably in a madhouse at Hoxton" On Sept 22 Mary Lamb, who had before shown signs of mania, in a sudden access of madness seized a knife and stabbed her mother to the heart Charles made himself responsible for the guardianship of his afflicted sister, who, on their father's death in 1799, returned to him from an asylum Their home was then in Chapel Street Pentonville Thenceforward, with such removals to an asylum as Mary's mental state necessitated, they lived together in that mutual dependence which makes their story one of the tenderest pages in literary history

Lamb had early leanings to literature, he had published sonnets and other verses in association with Coleridge and Charles Lloyd, when his first independent book, A Tale of Rosamund Gray and Old Blind Margaret, was published, 1798 Shortly afterwards he began contributing to the daily papers, and in 1801 published a five-act tragedy, John Woodvil

In the same year Charles and Mary moved back to their loved Temple, 16, Mitre Court Buildings There they wrote together Tales from Shakespeare, 1807, Mrs Leicester's School, 1808, and Poetry for Children, 1809 Of each Mary wrote about two thirds, she took the Shakespeare comedies To the same period belong other children's books, The King and Queen of Hearts (1806), and The Adventures of Ulysses (1808), also Specimens of English Dramatists Who Lived about the Time of Shakespeare (1808), from the publication of which dates the revived study of the 16th and 17th century English drama In 1809 the Lambs removed to 4, Inner Temple Lane, where they remained until 1817, when they went to 20, Russell Street, Drury Lane In 1818 his scattered contributions to periodicals were brought together in two volumes

In 1820 The London Magazine started and Lamb began those essays signed Elia, which were to give him a high and abiding place in literature The first of these, The South Sea House gave recol-

lections of his brief clerkship there, and from the surname of a fellow clerk he borrowed his famous pen-name. In 1823 came removal to 'Olebrook Cottage, Islington, and in the same year was published *Elia*; Essays which Have Appeared Under that Signature in The London Magazine. This volume was something new and remarkable in literature.

In 1825 Lamb retired on a pension of £450 a year. In 1827 came another removal, to Enfield, and in 1833 yet another, to Edmonton, whence he published The Last Essays of *Elia*. Charles died, Dec. 27, 1834, at what was Bay Cottage but is now Lamb's Cottage, Edmonton; he was buried in the churchyard. Mary, to whom he had devoted his life, died at St. John's Wood, May 20, 1847, and was buried in her brother's grave.

Lamb occupies a peculiar place in literature both as a writer and as a man. The rich humour of his essays, his blending of fancy and wisdom, tenderness and gusto, both as essayist and letter-writer, form something of irresistible and lasting charm. As essayist he is unique; as letter-writer, unexcelled; as dramatic critic, a pioneer. In poetry he can claim The Old Familiar Faces, and Hester, as classics. Thanks to the genial self-revelation of his work, and the fact that he was the loved and admired friend of many writers of his time, his personality is more familiar to readers than that of any other British author with the single exception of Dr. Johnson.

Bibliography. Works, 12 vols., ed. W. Macdonald, 1903; 7 vols., ed. E. V. Lucas, 1905; Memoir, B. W. Proctor, 1866; Charles Lamb, A. Ainger, 1882; W. Jerrold, 1905; Bibliography of Charles and Mary Lamb, J. C. Thomson, 1908; Life, E. V. Lucas, 5th ed. 1921; Life (by Talfourd), Letters, and Writings, new ed., 1924; C. L. and His Contemporaries, E. Blunden, 1933; The Frolic and the Gentle, A. C. Ward, 1934; The Lambs, K. Anthony, 1945.

Lamballe, MARIE THÉRÈSE DE SAVOIE-CARIGNANO, PRINCESSE DE (1749-92). A daughter of Louis Victor of Savoy - Carignano. She was born at Turin, Sept. 8,



Marie de Lamballe,
French princess

1749. In 1767 she made an unhappy marriage with the prince de Lamballe (d. 1768), a cadet of the French royal family. Living after his death

with his father, the duke of Penthievre, she became intimate with Marie Antoinette. In Aug., 1792, she was arrested and placed in the Prison de la Force, where on Sept. 3 she was murdered in the massacres. Her fate aroused indignation, for her head was carried on a pike past the queen's window. Memoirs published as hers in 1826 are spurious.

Lambayeque. Maritime dept. and city of N. Peru. The dept. is largely mountainous, with arid soil, except in the river valleys and on the mountain slopes, where there is a good grazing ground for cattle. Area, 4,613 sq. m. Pop. 192,890. The capital is Chiclayo



Daniel Lambert, famous fat man
From a contemporary print

(q.v.). The chief products are sugar, rice, tobacco, and cotton. The city of Lambayeque stands 6 m. from the mouth of the river of the same name, and is connected by rly. with Jayanca and Pacasmayo. It has a cathedral, and the manufactures embrace cottons, woollens, soap, and quinine.

Lambert. Unit of illumination due to incandescent emission, as from a lamp, or reflected from a polished surface. One lambert is the radiation of 2.054 candlepower (one lumen) per sq. cm. of diffusing surface and is independent of the distance of the surface. The unit was named after Johan Lambert (1728-77), German mathematician, who fixed its value. See Lumen.

Lambert, CONSTANT (b. 1905). British musician. The son of a painter and brother of Maurice Lambert, he was born Aug. 23, 1905, in London, and educated at Christ's Hospital, and the R.C.M. He was commissioned by Diaghileff to write a ballet, Romeo and

Juliet, produced 1926. Pomona appeared the following year. His best known ballet was *Horoscope*, 1938: Summer's Last Will and Testament, 1936, is for chorus and orchestra. The Rio Grande is a lively setting of Sacheverell Sitwell's poem for pianoforte, chorus, and orchestra. Lambert was musical director of the Vic-Wells, 1932-47, conducting ballet at Sadler's Wells and opera at Covent Garden. He directed his first promenade concert on July 28, 1945. Trenchant articles in the New Statesman established his reputation as a music critic, and his publications include *Music Ho!*, 1934.

Lambert, DANIEL (1770-1809). English freak. Born at Leicester, March 13, 1770, he succeeded his father as the keeper of the town gaol in 1791, and though he led an active and abstemious life, weighed 32 stone in 1793. In 1805 he resigned his post on an annuity of £50, and exhibited himself for profit. He weighed 52½ stone at the time of his death, which occurred suddenly at Stamford, July 21, 1809.

Lambert, JOHN (d. 1538). An English martyr, born at Norwich. Becoming a prominent critic of the established Church, he was obliged to change his name from Nicholson to Lambert to avoid persecution for Protestant heresy. Accused in 1538 of denying the Real Presence, he disputed for five hours with Henry VIII, and was burnt at the stake on Nov. 22.

Lambert, JOHN (1619-94). An English soldier. Born at Calton Hall, Yorks, he studied law. In 1642 he joined the parliamentary army, and soon rose to be a colonel. He served at Marston Moor and elsewhere, and when the new model army was formed became one of its chief officers. Major-general of troops in the northern counties, he helped Cromwell to win the battle of Preston, and was in charge of parliamentary forces in Scotland when the king was tried.



Constant Lambert,
British musician



John Lambert,
English soldier

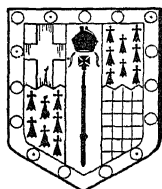
He held commands under Cromwell at Dunbar and Worcester, and between the two battles won an engagement at Inverkeithing. In 1651 he was named lord deputy of Ireland, but never took up the appointment.

A member of the council of state, he had a large share in drawing up the instrument of government and was one of the major-generals. At first in favour of Cromwell's kingship, he afterwards changed his mind, and about 1656 a serious dispute with the protector led to Lambert's retirement from active life. In 1659 he was again prominent. His reputation caused the soldiers to turn to him for leadership, and it was a force under him that crushed the rising in Cheshire. He then put an end to the recalled Long Parliament. For a moment Lambert and Monk, their armies facing each other, were the two most powerful men in the country, but the former lost many men by desertion. At the Restoration he was sentenced to death, but the sentence was changed to one of imprisonment. He was incarcerated in Guernsey when he died.

Lambert, MAURICE (b. 1901). British sculptor. Son of a painter and brother of Constant Lambert, he was educated in London and studied his art under Derwent Wood. During the 1920s he exhibited sculpture regularly with the London Group. Much of his work was influenced by Sumerian sculpture. Elected A.R.A. in 1941, Lambert is represented at S. Kensington, the Tate Gallery, and Manchester art gallery.

Lambessa. Town of Algeria, the ancient Lambaesis. It is situated 7 miles S. of Batna, in Constantine prov., and was built by the Romans in A.D. 125 as the headquarters of the Third Augustan Legion. There are numerous Roman remains, including the arches of Commodus and of Septimius Severus. In the neighbourhood are extensive and well-preserved ruins of Timgad, the Roman Thamugas.

Lambeth. One of the 28 bors. of the co. of London. Between Southwark and Camberwell on the East, and Westminster and Wandsworth on the W., it includes Kennington, Stockwell, Brixton, Herne Hill,ulse Hill, Vauxhall, and part of Norwood,



Lambeth borough arms



Lambeth. The Town Hall, Brixton Hill

also the S. approaches to Waterloo. Westminster, Lambeth, and Vauxhall bridges over the Thames, and extends to the Crystal Palace, some 7 m. The Albert Embankment (*q.v.*) stretches from Westminster Bridge to Vauxhall. The parish church, S. Mary's, adjacent to Lambeth Palace, was rebuilt

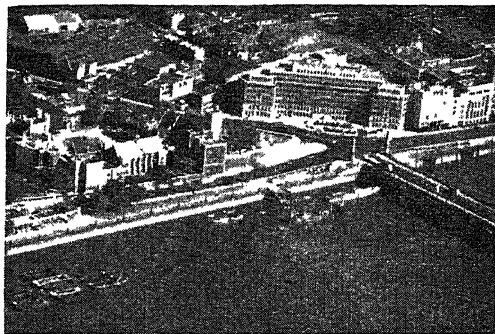
1851, on the foundation of a 15th century structure, of which only the tower, associated with the flight of Mary of Modena in 1688, remains. In S. Mary's are the graves of Archbishops Bancroft, Cornwallis, Hutton, Moore, Secker, and Tenison, Bishop Tunstall, and Elias Ashmole. Other

notable buildings include the town hall, 1908, at Brixton; Christ Church, Westminster Bridge Road; Doulton's pottery works; Waterloo rly. station; Union Jack Club; Old Vic Theatre; 8 public libraries; S. Thomas's, Royal Waterloo, South-Western Fever, and King's College hospitals. Within the boundary are Kennington Oval, and Kennington, Camberwell, Brockwell, Ruskin, Norwood, Archbishop's, and Vauxhall Parks.

Between Belvedere Road and the Thames, E. of Westminster Bridge, was a plot of ground known as Pedlar's Acre, bequeathed to Lambeth by a pedlar, who is commemorated by a window in the parish church. It was acquired for £81,000 by the L.C.C. as a site for the County Hall, the foundation stone of which

was laid in 1912. The new County Hall dates from 1932. John Tradescant, the botanist, had a physic garden and museum in South Lambeth. The original swamp near the river is recalled by the names Upper and Lower Marsh; Upper Marsh and The Cut being noted for a street market. Lambeth Bridge, 1862, superseded a horse ferry; hence Horseferry Road. The present bridge, costing nearly £1,000,000, was opened July 19, 1932, by George V. During the Second Great War, German air raids caused 4,300 deaths and serious injuries and damaged 140 public buildings, and 42,000 houses. Three M.P.s are elected. Pop. est. 220,000. Consult History and Antiquities of the Parish of Lambeth, T. Allen, 1827.

Lambeth. Glazed earthenware produced in Lambeth. In 1630, Dutch potters were turning out there a kind of delft, decorated with landscapes in blue. Later on portraits were painted on plates, dishes, and cups. Then came white



Lambeth. Lambeth Palace (left), Lambeth Bridge House (Ministry of Works), and Lambeth pier

bottles and jugs, bearing the words Sack, Claret, or the arms of the city guilds. Later, English potters produced a kind of Palissy ware, decorated with nude figures in high relief. At Coade's Artificial Stone Works, established in 1760, John Bacon, who became R.A., modelled figures and architectural pieces. Another potter produced glazed stoneware for chemical manufacturing, and this industry still flourishes. The Lambeth pottery was established by Doulton (*q.v.*).

Lambeth Conference. Gathering of the bishops of the Anglican Church throughout the world. They are held decennially at Lambeth Palace, for consultation on important church questions. The first was held in 1867 under the presidency of Archbishop Longley, and



Lambeth Palace. Left, the guard room, hung with portraits of archbishops since 1503. Right, chapel, restored in the 19th century, with screen attributed to Laud, gutted by fire in 1941

was attended by 76 bishops out of a possible 144; that held in 1908 was attended by 242. Although the decisions arrived at in these conferences have only a moral binding force on the Church, they have had far-reaching results.

The conference of 1920 issued a famous appeal to the churches of Christendom for reunion. This was modified in an encyclical letter issued by the conference of 1930, when 308 bishops attended. Six subjects were on its agenda: the Christian doctrine of God; the life and witness of the Christian community; the unity of the church; the Anglican communion; the ministry of the church; youth and its vocation. The conference arranged for 1940 was held over until 1948. *See Church of England.*

Lambeth Palace. London residence since the 13th century of the archbishops of Canterbury. Known first as Lambeth Manor, and from the time of Laud down to the 19th century as Lambeth House, it is on the right bank of the Thames, which here runs N. and S., between S. Thomas's Hospital and Lambeth

Bridge, and is built partly of red brick and partly of grey stone. The style varies from Early English to Late Perpendicular.

The Gate House entrance was built by Morton, 1490, incorporating parts of an earlier one. At the end of the outer court rises Chicheley's Water Tower, popularly called the Lollard's Tower (*q.v.*), 1434, restored 1873. In the stair turret is the so-called Lollards' Prison, with its heavily barred casements, massive iron rings upon the walls, and numerous inscriptions. In a larger room called, from the supporting pillar in its centre, the Post Room, Elizabeth's favourite Essex, in 1601, and the poet Lovelace, in 1648, were prisoners.

On the right is the Great Hall, built by Juxon, replacing the

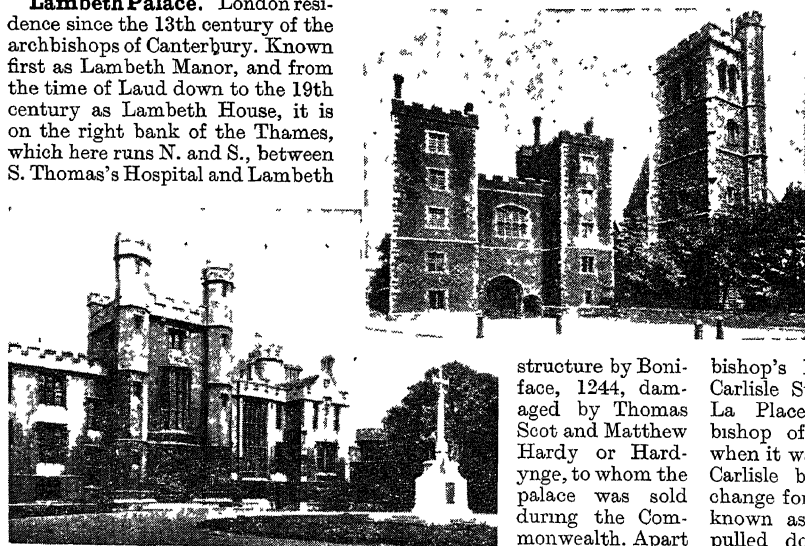
open timber roof is its most famous feature. This hall was damaged by fire following a German air raid in 1941. The library, begun by Bancroft in 1610, and preserved at Cambridge during Puritan times, contains a copy of Rivers's translation of the *Dictes or Sayings of the Philosophers*; the Gospels in Irish, once belonging to Athelstan; Aldhem's *De Virginitate*; a Koran that belonged to Tipoo Sahib; Elizabeth's Prayer Book; the Gutenberg Bible on vellum; and many other treasures.

From the library a staircase leads to the old guard room, now the dining hall, with a 15th century oaken roof, and many historical portraits; reconstructed 1829-34. The chapel, c. 1230, suffered sadly in 1941, when its roof and furnishings were destroyed. In the ante-chapel is the tomb of Archbishop Parker. The crypt, excavated in 1907, was a rest centre in the Second Great War. The modern residential buildings, in the inner court, date from 1829-38; these were also damaged.

Part of the extensive grounds was made a public recreation ground in 1900, and is known as Arch-

bishop's Park. East of this is Carlisle Street, near which stood La Place, town house of the bishop of Rochester until 1540, when it was given to the bishop of Carlisle by Henry VIII, in exchange for a house in the Strand; known as Carlisle House, it was pulled down in 1827. *Consult Lambeth Palace and Its Associations, J. Cave-Brown, 1882.*

Lambeth Walk. London thoroughfare, in the borough of Lambeth. On the S. side of the



Lambeth Palace. Courtyard and residential buildings erected by Archbishop Howley, 1829-38. In the foreground is a memorial, erected 1931, to Randall Davidson who was Archbishop of Canterbury, 1903-28. Upper picture, South Gateway, the main entrance, dating from 1490. On the right is Lambeth parish church

structure by Boniface, 1244, damaged by Thomas Scot and Matthew Hardy or Hardynge, to whom the palace was sold during the Commonwealth. Apart from the library of 30,000 books and MSS. which it has housed since before 1834, its

Thames, it runs parallel with the river. It has a street market, and the centre and S. end of the thoroughfare were damaged by German bombs in the Second Great War. The street gave its name to a popular song written by Noel Gay for the musical comedy *Me and My Girl*, produced at the Victoria Palace, London, in 1937. Earlier versions of an old Cockney street song about the Lambeth Walk had been published in 1899 and 1924. A dance routine set to the tune, and based on the processional dance in the play, invaded the floors of all types of English ballroom during 1938-39.

Lamego. City of Portugal, in the dist. of Vizeu. It stands near the Douro, 6 m. S. of the rly. station at Peso da Regoa, and 42 m. E. of Oporto. The picturesque old city is built on a hillside, has a Moorish castle, a magnificent cathedral (1129), and in Santa Maria Maior de Almaceva, a mosque converted into a church, the seat of the cortes de Lamego in 1143, which regulated the succession to the crown of Portugal. There are extensive vineyards. An important industry in the district is raising swine for the noted Lisbon hams. The town was wrested from the Moors in 1057 by Ferdinand I of Castile and Léon. Pop. 9,850.

Lamellibranchiata (Lat. *lamella*, thin plate; *branchiae*, gills). In zoology, the name for a great class of headless molluscs whose shell consists of two closely fitting valves. According to some systems of classification it is termed *Pelecypoda*. These animals are also known as bivalves (*q.v.*). See *Mollusca*.

Lamellicornia (Lat. *lamella*, thin plate; *cornu*, horn). Name of a large super-family of beetles including more than 20,000 species, over 90 being found in the U.K. The group is distinguished by the antennae ending in a more or less plate-like club. The group's largest family, the *Scarabaeidae*, includes dung-beetles, cockchafers, and their allies, while the *Lucanidae* are stagbeetles. Included in the *Lamellicornia* are the hercules, goliath, rhinoceros, and others of the largest known beetles.

Lamennais, HUGUES FÉLICITÉ ROBERT DE (1782-1854). French philosopher and publicist. Born at St. Malo, Brittany, June 19, 1782, he published in 1808 an able study of the importance of the Church in society, which was confiscated by Napoleon's police as hostile to the constitution. He

was in London during 1815, and next year was ordained priest. His essay on *L'Indifférence en Matière de Religion*, 1817 (Eng. translation 1898) was a vigorous defence of authority against liberty of opinion; but democratic ideas were influencing his thought when in 1829 he published *Progrès de la Révolution*. He founded his paper *L'Avenir* in 1830, and with Montalembert a society for the defence of religious liberty. Both were condemned by Rome in 1832, and in the impassioned *Paroles d'un Croyant*, 1834, Lamennais broke with the Church. Thenceforth he was allied with democratic forces in politics, and sat in the constituent assembly as a radical from 1848 until the *coup d'état* of 1851. During 1840-46 he produced *Esquisse de Philosophie*. He died in Paris, Feb. 27, 1854.

Lamentations, BOOK OF. O.T. writing belonging to a group known as The Five Megilloth (*i.e.* Rolls). One of the Hebrew titles is *kinôth*, *i.e.* Dirges or Lamentations. In the English versions the book is called The Lamentations of Jeremiah. It contains five independent poems, four of which are alphabetic and written in the so-called *kînâverse* (a solemn metre consisting of three beats followed by two).

The poems are lamentations over the destruction of Jerusalem by Nebuchadrezzar in 586 B.C., and are ascribed by an ancient tradition to Jeremiah. This tradition is preserved in the preface to the Septuagint version, which says: "And it came to pass after Israel was taken captive and Jerusalem desolated, Jeremiah sat down weeping, and uttered this lamentation over Jerusalem, and said." The words, however, do not necessarily mean that all the poems were composed by Jeremiah, and many scholars consider that the internal evidence (stylistic, etc.) indicates that they were not. Probably the book is not a unity, but includes poems by several authors, of whom the most important was the prophet Jeremiah. See *Bible*; *Old Testament*.

Lameth. Name of a famous French family, of which three members were prominent in the time of the Revolution. Alexandre Théodore Victor (1760-1829) was a leading member of the constituent assembly. Afterwards he went over to the king's side and was exiled from France. In 1814 he returned and took part again in public life until his death, March 18, 1829. He wrote a *History of the Constituent Assembly*, 1828-

29. His two brothers, Théodore (1756-1854) and Charles (1757-1832), both held public positions in France.

La Mettrie, JULIEN OFFROY DE (1709-51). A French philosopher. Born at St. Malo, Dec. 25, 1709, he studied theology and then medicine in Paris and Leyden. He obtained a medical appointment in Paris, but owing to quarrels with his colleagues retired to Leyden, where he published his great work, *Man a Machine*. In 1748 he was summoned by Frederick the Great to Berlin, where he died on Nov. 11, 1751. Starting from the Cartesian theory of the automatism of animals, La Mettrie argues that if animals, by means of their nervous system, can feel, apperceive, remember, and judge without an immaterial soul, man has no need of one either. Life is a farce, which ends with death (*La farce est jouée*).

Lamia. (1) In Greek mythology, a fabulous monster which was supposed to devour children. (2) Name of an old Libyan queen who, to avenge the death of her own children slain by Hera, slew all other children she could lay hands upon. In later legend, Lamia became a beautiful female who, like the vampire, gained the affections of handsome young men and then sucked their blood and ate their flesh. Lamia is the title of a romantic poem, a narrative in rhymed couplets, by Keats, derived from a classical source.

Lamia (Turkish, *Zeituni*). Town of Greece, capital of the nome or prov. of Phthiotis and Phocis. At the head of the gulf of the same name, it is a centre for textile industries based upon locally produced supplies of wool, etc. Tobacco also is grown and camels are reared. The main railway from Athens passes W. of the town, which is a bishop's see and contains an ancient fortress. Pop. 14,205. In ancient Greek history, Lamia gave its name to the Lamian war, undertaken to deliver Greece from the Macedonian yoke. The allied Greeks at first gained some successes, but after the battle of Crannon (322) they were forced to submit. See *Antipater*.

Laminar Flow (Lat. *lamina* thin layer). A method of design applied to aerofoils, especially the wings of high speed aircraft. Such construction, developed in the later stages of the Second Great War, embraced an aerofoil section with maximum depth near the mid-chord point, and an exceptionally smooth surface.

Laminariaceae. A family of seaweeds. Known as wracks and tangles, they include the giants of the race. They have long, broad, leathery fronds which in the littoral zone form efficient natural breakwaters. The large oarweeds and wracks (the *Laminaria*) are well known to every seaside visitor; but the N.W. American *Nereocystis* has stems 300 ft. long, with cask-like buoys 6 ft. long, filled with air. In the deep waters of the Antarctic, *Macrocystis* has ribbon-like fronds *Alaria* 700 ft. or 800 ft. long. The fronds of *Alaria esculenta* are in places used as food.

Laminated Materials (Lat. *lamina*, thin layer). Industrial products in which successive layers of thin material are bonded together with a suitable adhesive to build up a sheet, rod, tube, or other section of desired dimensions. Laminated materials are formed by bonding together layers of a fibrous material, such as paper, woven textile, or glass fabric, with a thermo-hardening synthetic resin, of a phenol-formaldehyde, urea-formaldehyde, or melamine-formaldehyde type. Thickness for thickness, they become much stronger than the basic material. Plywood (*q.v.*), made by bonding wood veneers, is a similar product.

Early in the 20th cent. shellac was used as a bonding agent for paper to produce insulating materials. Desire to find substitutes for shellac stimulated the production of synthetic resins, which took definite form following Baeke-land's pioneer research on phenol-formaldehyde condensation resins (*see* Resins).

Laminates can be produced with both thermo-softening and thermo-hardening agents. In their simplest form they are prepared by treating the continuous web of fabric or paper with an alcoholic solution of a one-stage phenol-formaldehyde resin. The volatile solvent is eliminated by the application of heat, and the impregnated material is then cut into pieces of the desired length. The cut sheets are assembled in packs and pressed at 125° C. to 160° C. and 1,500 to 2,000 lb. per sq. in. This causes the resin to melt and bond the sheets together; the heating is continued sufficiently to "cure" the resin and make it insoluble and infusible. The time necessary to complete this will depend on the bonding resin used and the thickness of the sheet. The material is cooled in the press, and after trimming is ready for use.

While most laminated materials are fully cured, in others a special fabric reinforcement is used and the bonding resin is only partially cured. Such sheets can be softened by heat, and within limits can be shaped by hot pressing, the extensibility of the fabric reinforcement naturally limiting the depth of the "draw" possible. These materials, usually called "post-forming" laminates, offer new possibilities of manipulation, and the production of units which, in their finished state are thermo-hardened.

A limiting factor in the production of laminates was the heaviness and costliness of the high pressure plant needed. The production of esters, or other compounds, which can, by the use of suitable catalysts, be polymerised at low temps. and pressures changed that. For example, alkyl phthalate copolymerised with styrene gives thermo-setting products which, with suitable reinforcement, possess great strength. This has led to the splitting of the laminating industry into well defined sections, and according to whether the process is carried out at high, low, or the slight pressure necessary to retain or contact the laminae, the products are known as high, low, or contact laminates.

Low Pressure Laminates

High pressure laminates are produced in standard sheet, rod, and tube sections. Low pressure and contact laminates can also be produced in units of any desired shape and section, and since simple wood, metal, plaster, or cast-resin formers can be used for this purpose, mould costs are low, and the process can be applied to production in short runs. In operation the process is simple. Into the relatively cheap mould, a textile or glass fibre reinforcement is placed suitably tailored, and this is impregnated with the bonding liquid. Light pressure, sufficient to compact the reinforcing mass, is applied and the whole mass is then heated to a temp. sufficient to polymerise the bonding agent. The time and temp. to be applied depend on the bonding material used, and on the nature and thickness of the unit to be produced, but 240° F. for 15-20 mins. is usually sufficient. Since some bonding agents are clear and water white, laminates of remarkable beauty can be produced, by using continuous webs of woven glass fibres.

Fibrous laminates are used in general structural purposes for

their strength and durability. Silent running gear wheels and other mechanical driving gear are made from them. Contact laminates are used for interiors and panelling in aircraft.

Plastics are also used in the production of laminated or multi-layer materials. The layers of specially woven fabrics are bonded together with thermo-softening cellulose ester plastic compositions to form durable sheets for conveyor belts, brake linings, etc. Sheets of glass are bonded with interlayers of cellulose acetate, cellulose acetate butyrate, or polyvinyl butyral plastic to produce sheets for automobile wind-screens, still widely used in the U.S.A. after they had been superseded in Great Britain by surface-hardened or toughened glass (*see* Safety Glass).

Structural Use of Laminates

Laminates in sandwich form are now used structurally indoors. In their simplest form these consist of outer skins of laminated or resin bonded fibrous aggregates, with relatively thick interlayers of a light-weight cellular plastic. This latter may be prepared from paper or fabric impregnated with a phenolic resin, or it may be expanded phenolic, cellulosic, styrene, or vinyl plastic. Such materials as these are remarkably light yet strong, and are specially suitable for lightweight doors.

The use of resinous bonding agents for the aggregation of discontinuous fibrous materials, such as sawdust and wood chips, to form sheets for internal structural work, is important. Specially prepared chips and sawdust are first treated with a solution of a phenolic or urea resin, and then pressed into sheet form. These sheets can be fully or partially cured, partially cured sheets being useful as cores for sandwich laminates. Faced with aluminium sheet or wood veneer, they are also used in the furniture industry.

V. E. Yarsley

Lamination (Lat. *lamina*, leaf, thin plate). In geology, series of thin sheet-like layers in some sedimentary rocks. It may be shown by variations in colour or texture. It is usually parallel to the bedding, but may show inclination to it. Such cross-lamination is caused by deposition from moving currents, and is common in deltas and sand dunes.

Lamlash. Village on the E. coast of the isle of Arran, Scotland. It stands on a fine bay in the firth of Clyde, completely sheltered by

Holy Island. At Lamlash experiments were carried out during the Second Great War on the project known by the code name of Lily, which covered a design by R. M. Hamilton for an air-strip floating on the surface of the water.

Lammas. The festival of the wheat harvest, observed in the early English Church on Aug. 1. The name comes from A. S. *hlaf-maesse* (loaf-mass), in allusion to the loaves of new wheat presented in church as first-fruits. Lammas was formerly known as the Gule of August, gule (yule) possibly meaning noise, hence rejoicing. Lammas was one of the English quarter days, and is still a quarter day in Scotland (Aug. 12). In Lothian, the cattle boys built towers of stones and sods, which they attacked and defended at Lammas. Lammas lands belonged to the owners while in corn or grass, and were afterwards subject to common rights of pasturage. The expression "at latter Lammas," meaning "never," arose from the abuse of the custom of tenants bringing their wheat to their lords after Lammas in backward seasons. Lammas floods is a term applied to a rainy period about the first week in August.

Lämmergeier (Ger., lambs' vulture). Large bird of prey, belonging to the vulture group. It is found in S. Europe, W. and Central Asia, and N.E. Africa, and lives

have been extinct there since 1887. It feeds mainly upon carrion, and is said never to attack living creatures. The nest is built on ledges of inaccessible cliffs, and consists of a huge mass of sticks lined with rags or any soft material the parent birds can find.

Lammermuir OR LAMMERMOOR. Range of hills in Berwickshire and East Lothian, Scotland. They extend in an E.N.E. direction between the vale of Gala Water and St. Abb's Head. Mickle Sals (1,749 ft.) and Lammer Law (1,733 ft.) are the culminating summits. Ravenswood, the Wolf's Crag in Scott's Bride of Lammermoor, is situated on a spur towards the sea.

Lamond, FREDERIC (1868-1948). Scots pianist, born Jan. 28, 1868, in Glasgow. At Frankfurt he was a pupil of Bülow and Liszt, and he made a public appearance at Glasgow in 1886. Establishing a world-wide reputation as a pianist of depth of feeling, he was esteemed especially for his playing of Beethoven. Professor at the Hague conservatoire, 1917, and from 1939 at the Scottish national academy of music, he composed a trio for piano and strings, sonata for piano and cello, a symphony, and overtures. Died Feb. 21, 1948.

Lamoricière, CHRISTOPHE LÉON LOUIS JUHAULT DE (1806-65). French soldier. Born at Nantes, Feb. 5, 1806, he saw service in

Algeria, soon became a general, and acted for a time as governor-general there; he was responsible for defeating Abd-el-Kader in 1842, and for his capture in 1847. Returning to France, he became a member of the chamber of deputies. He helped to put down the rising of 1848 and took office as minister of war,

but in 1851 was exiled for continuous hostility to Napoleon III. In 1860 Lamoricière took command of the pope's troops, but his force was crushed by the king of Sardinia at Castelfidardo. Allowed to return to France, he died Sept. 11, 1865.

La Motte, ANTOINE HOUDART DE (1672-1731). French man of letters. Born in Paris, Jan. 17, 1672, he early began to write for the theatre. Taking part in the great controversy as to the relative

merits of ancient and modern writers, he took the side of the latter, and made a paraphrase in verse of Madame Dacier's translation of Homer to prove that the Iliad could be abridged to half its length. In 1719 he published a volume of witty Fables, Eng. trans., 1721, and in 1723 made his chief success with *Inès de Castro*, which has been acclaimed as being nearly a great play. In essays and letters his prose rivalled that of his great contemporary Fontenelle. He died Dec. 26, 1731.

A. H. de la Motte, French man of letters
After Rigaud

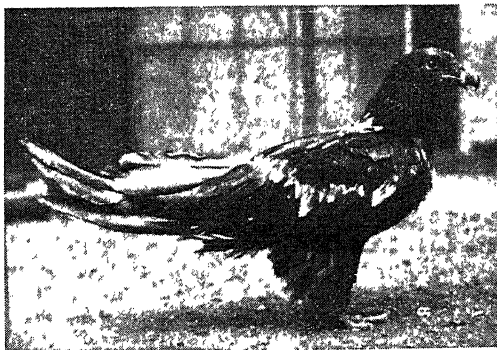
La Motte OR LAMOTHE, JEANNE DE VALOIS, COMTESSE DE (1756-91). French adventuress. Claiming descent from the blood-royal of France, she was a beggar when befriended by the Countess Boulainvilliers and brought into touch with the court circle. She married M. de la Motte, called count with little authority. She induced Cardinal de Rohan to purchase the famous diamond necklace on credit, on the pretence that it was coveted by the queen. Branded and imprisoned in 1786 for her part in this transaction, she escaped to London, and was killed by falling from a window while endeavouring in a drunken condition to escape seizure for debt, Aug. 23, 1791. See Diamond Necklace; Marie Antoinette; consult La Motte's Autobiography, 1789.

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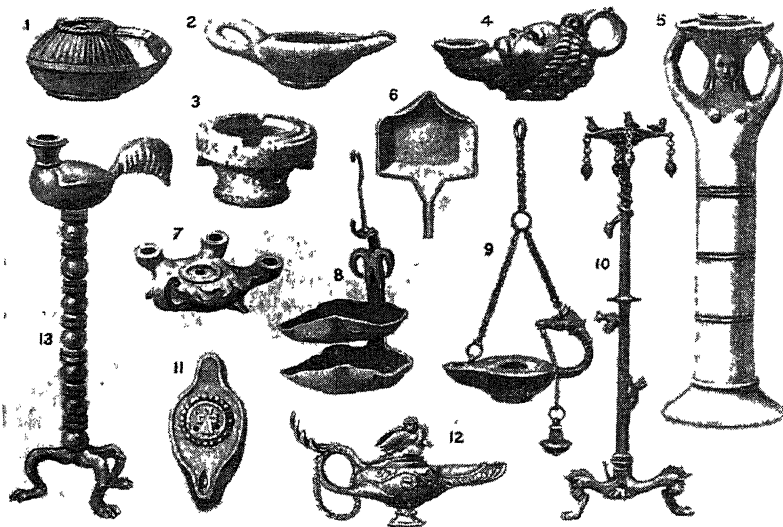
Lamp (Gr. *lampein*, to shine). Vessel for holding inflammable material intended to be burnt for the production of light or heat. The oldest lamps known are shallow stone basins from French palaeolithic caves. This invention, carried across Eurasia, was preserved by the Eskimo, the only lamp-using people in pre-Columbian America. They still employ blubber and moss in open soap-stone basins.

The invention of the pottery lamp, wherein animal oil, and afterwards vegetable oil, was burned at a wick confined in a nozzle, is attributable to the Mediterranean region. It probably arose in the early metal age,



Lammergeier. Large bird of prey, often called the bearded vulture

always among the mountains. The plumage is black on the upper parts and orange below, with a whitish head and white markings on the wings. The wings may be 9 ft. in expanse. Unlike the true vultures, the bird has a head completely feathered; and the curious tuft of bristles at the base of the beak leads to the popular name of bearded vulture (*Gypaetos barbatus*). It was formerly fairly common in the Alps, but is believed to



Lamp. Examples of ancient lamps. 1. Egyptian. 2 and 3. Cretan, 2000-1000 B.C. 4. Babylonian. 5. Terra-cotta, 7th cent. B.C. 6. Mycenaean, c. 1500 B.C. 7. Etruscan. 8. Early Celtic. 9. Roman, bronze hanging lamp. 10. Roman, bronze standard. 11. Roman, with Christian emblem. 12. Greek or Roman hand lamp. 13. Anglo-Saxon

perhaps in connexion with the tendance of the dead. Examples from about 2000 B.C. have come from Gezer rock-tombs in Palestine. The original form, a shallow bowl with one end pinched in, gradually passed—in Egypt and elsewhere—into the closed type, with central apertures for filling and end apertures for wicks. These lamps, sometimes shaped as birds, fish, and other animal forms, are characteristic of the Greco-Roman world, and exhibit Christian designs in the Roman catacombs. Highly decorative bronze lamps, sometimes with many nozzles, and designed for suspension from a chain or on a stand, were used by the opulent classes. The classical lamp was perpetuated through the Byzantine into the Saracenic period, and magnificent ceramic examples are extant.

Apart from the introduction of spun cotton and other fibres, which utilised better the principle of capillary attraction, and reduced smoke, no improvement in technical efficiency was effected until after the Renaissance.

One of the earliest advances in the method of combustion of the oil was at the end of the 18th century, when the small round wicks were replaced by flat ones. These ran in a metal casing, so separating the flame from the oil, and were adjusted by means of a toothed wheel which gripped the wick. Argand, the Swiss chemist, in 1784 further improved the lamp by substituting a tubular wick moving

between metal cylinders. The inner cylinder allowed a draught of air to play upon the wick, thus increasing the combustion. This burner, with various modifications and the addition of a glass chimney, remains the basis of nearly all oil lamps.

Later improvements in oil lamps took the form of burning an atomised mixture of air and oil beneath an incandescent burner, the white hot fabric of which gives an intense illumination. For electric lamps, see below; also Lighting. For gas lamps, see Lighting. See Arc Lamp; Davy Lamp; Lantern; Safety Lamp; Torch.

Lamp, ELECTRIC. While the first electric lighting seen in the U.K. was by arc lamps, most electric lamps since have been of the incandescent filament type. Those of 1880 had carbon filaments, superseded by tantalum (1905) and tungsten (1909). The Nernst lamp (1897), which had a filament of alkaline earths operating in air, was popular for about ten years, but its chief drawback was that the filament had to be preheated. As a carbon or wire filament could not operate in air because it would be immediately consumed, to prevent the oxidation of the filament it was contained in a vacuum.

An improvement was made in 1913 by coiling the filament to limit the loss of heat and filling the bulb with an inert gas in place of a vacuum. A further advance in mains voltage lamps brought in

1934 the "coiled coil" lamp. By forming the coiled filament into a second coil, a further reduction was made in heat losses, and lamps became four to eight times as efficient as the original types.

Filament lamps can be made in all sizes, from the smallest bulb, no larger than a small pea, lit from a single cell to lamps for light-houses which consume several kilowatts and are supplied by a dynamo driven by an 8-10 h.p. engine. Battery lamps range from torch bulbs of the vacuum type, consuming a fraction of a watt, up to car lighting and projector types of 100 watts. The latter are invariably gas-filled with coiled filaments; a point-

source of light is formed which can be reflected in a powerful beam. Voltages of battery lamps range from $1\frac{1}{2}$ to 24 volts.

The principle of the gas discharge lamp had been known since the late 19th century, but not until 1926 was the sodium discharge lamp first used for streets. It was soon followed by the mercury discharge lamp. These two are used where it is not essential to discriminate between colours, this being impossible with both types on account of the deficiency in both lamps of certain rays (particularly red) in the spectrum. The gas discharge lamp has similar characteristics to the carbon arc lamp; the sodium or mercury is volatilised by the passage of the current through a conducting gas. Sodium gives a light of orange colour, mercury a greenish blue. The mercury discharge lamp, which produces ultra-violet light, also forms the basis of the fluorescent lamp.

Electric lamp caps carry the contacts for entry of the current. Types commonly in use are:

Miniature Edison Screw—Torch bulbs and cycle lamps.

Edison Screw—Projector lamps and mains voltage bulbs of 150 watts. Goliath Edison Screw—Mains voltage bulbs of 300-1,500 watts.

Small Bayonet Cap (SBC) type (single or double contact)—Car lighting bulbs.

Large Bayonet Cap (LBC) type (2-pin)—Mains voltage bulbs of 15-100 watts. Low voltage bulbs for trains and public service vehicles.

Large Bayonet Cap (LBC) type (3-pin)—85 and 125 watt mercury discharge lamps.

See Fluorescent Lamp, Lighting.

Lamp-black. Carbon, in the form of soot, produced by the incomplete combustion of an organic substance. The term is sometimes used as synonymous with carbon black, but generally is restricted to the material produced when oils, tars, pitches, hydrocarbon gases, etc., are burned in an open chamber with a limited supply of air. The soot so produced is collected on cloths or by spraying with water and filter-pressing the resulting slurry. Lamp-black is used to make printers' and other inks, as a pigment in paints and enamels, and as a pigment and filler in wax polishes. Carbon black is also used for these purposes; the deciding factor often is cost. True lamp-blacks have a bluish, carbon blacks a brown, undertone.

Lampedusa. An island in the Mediterranean. It lies W.S.W. of Malta, about 113 m. S. of Agrigento in Sicily and 88 m. E. of Tunisia. It is 7 m. long, about 2 m. broad, and has an area of nearly 12 sq. m. Its products are fruit and grain. Between the island and Malta is the deep channel connecting the E. and W. basins of the Mediterranean Sea. The small island of Linosa lies to the north. Belonging to Italy, Lampedusa was heavily attacked by Allied aircraft on June 11, 1943, throughout the night, and most of the following day, the garrison surrendering on the 13th. The so-called 'king of Lampedusa' was an R.A.F. sgt.-pilot, S. Cohen, to whom a formal but unofficial surrender was made on June 12, after he had made a forced landing. The island was demilitarised under the peace treaty, 1947.

Lampeter. Mun. borough and market town of Cardiganshire, Wales. It stands on the Teify, and is served by railway, being 27 m. N.E. of Carmarthen. The chief buildings are the parish church of S. Peter, much restored :

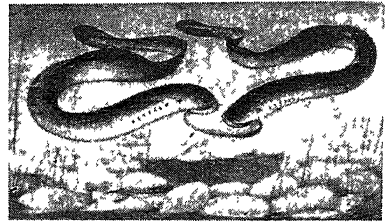
the R.C. church of Our Lady of Mount Carmel; and S. David's College for training candidates for the ministry of the episcopal church. Established in 1822, this is a fine building, famous for its library, and is affiliated to the universities of Oxford and Cambridge. Founded by a Celtic missionary, S. Pedr, whence its name, Lampeter had a castle in the Middle Ages demolished in the 12th cent. In the 14th century it became a town. Market day, Fri. Pop. 1,742.

Lampman, ARCHIBALD (1861-99). A Canadian poet. Born at Morpeth, Ont., he entered the civil service. He achieved wide recognition as Canada's foremost nature poet by the publication of three volumes: *Among the Millet*; *Lyrics of Earth*; *Alcyone*.

Lampoon. Satire or low censure of a directly personal character, generally in the form of brief prose or verse directed against public individuals. The term is derived from an old French word, *lampon*, which originally meant a drinking-song with the refrain *lampons*, let us drink. Possibly these songs included improvised satire, and so the word came to be fixed on the frequently vulgar satire associated with the lampoon. It has generally been in use at times of great social ferment. See Satire.

Lamport & Holt. A British steamship line. It was founded at Liverpool in 1845, and was the first line to send ships to the River Plate. The trade to Argentina and Brazil was developed and, turned into a limited company, the concern became the Liverpool, Brazil and River Plate Steam Navigation Co. It has freight and passenger services from Liverpool, London, Glasgow, Middlesbrough, and Hull to the ports of Brazil and Argentina, and also sends steamers with passengers and mails between New York, Brazil, and River Plate. Other ports served include Antwerp, Havre, and New Orleans. The head office is in Royal Liver Building, Liverpool, the London office at 85, Gracechurch St., E.C.3.

Lamprey (*Petromyzon*) Fresh-water animal. It is often regarded as a fish but belongs to the zoological order Cyclostomata (round-mouthed).



Lamprey. Two of the fresh-water species collecting stones to make a nest for their eggs

It differs from the fishes in having neither scales, paired fins, nor jaws, as well as in various points of internal anatomy. In appearance it is eel-like, but has a round sucking mouth with which it attaches itself to stones and other objects. Three species occur in Great Britain. One is marine (*P. marinus*) and attains a length of over 3 ft., while the other two (*P. fluviatilis* and *P. branchialis*) live in the rivers and are much smaller.

The lamprey feeds upon small water creatures and upon dead bodies, sometimes attaching itself to living fish and rasping holes through the skin. In the spawning season it collects a heap of stones, which it moves by means of its sucker-like mouth, and deposits its eggs in the chinks of the heap. Its flesh was formerly esteemed for the table; King Henry I is said to have died of a surfeit of them. See Animal; Hag-fish.

Lamprophyre (Gr. *lampros*, bright). In geology, a group of igneous rocks occurring in small masses, characterised by abundance of iron-magnesium silicates (biotite-mica, hornblende, pyroxenes, olivine, etc.). The strong cleavage of these minerals reflects light, hence the name, though the minerals themselves give a dark colour to the rocks. The ground mass of the rocks often contains much calcite, and they are easily decomposed by weathering. The group is of scientific interest only.

Lamson, GEORGE HENRY (ex. 1882). British poisoner. He was executed April 28, 1882, for the murder of his brother-in-law, Percy Malcolm John, a crippled youth aged 18, at a school at Wimbledon. The case presented difficulties owing to the fact that aconitine, the irritant vegetable poison used, was new in criminal annals. Lamson, a surgeon, was in desperate monetary straits, and would have benefited to the extent of £3,000, through his wife, by his brother-in-law's death. He called at the school on December 3 1881. The schoolmaster, the pupil, and Lamson ate Dundee cake produced by



Lampeter, Cardiganshire. Quadrangle of S. David's College, dating from 1822



Lanark, Scotland. High Street and parish church

the last-named from his bag. Lamson recommended to the master some capsules, which he said he had bought on a recent visit to America, as useful for doctoring the boys, and persuaded his brother-in-law to swallow one. The boy was seized with heartburn half an hour after his departure, and died the same night.

Lamu. Island and seaport of Kenya Colony, about 140 m. N.E. of Mombasa. Formerly a Persian settlement and later the headquarters of Arab civilization on this part of the coast. Lamu is the chief port of Tanaland. There are the remains of a Portuguese church and other architectural antiquities. Lamu was recognized as a possession of the sultan of Zanzibar on Nov. 1, 1886, and is situated in the Witu sultanate.

Lamy, ÉTIENNE MARIE VICTOR (1845-1919). French author and politician, born at Champignolles, Jura, June 2, 1845. He published his first volume, *Le Tiers Parti*, in 1868, and in 1871 was elected to represent Jura in the chamber of deputies. Three years later, in consequence of the attitude of the government towards the R.C. church, he broke with his party, failed to secure re-election to the chamber, and thenceforth devoted himself to literature. In 1883 an anonymous article on *La République* in 1883 created a stir. His writings included *L'Armée et la Démocratie*, 1889; *Études sur le Second Empire*, 1895. In 1905 Lamy was elected to the Academy, becoming its sec. in 1913. He died Jan. 9, 1919.

Lanark. A royal, mun., and police burgh of Lanarkshire, Scotland, also the co. town. It stands upon high ground above the right bank of the Clyde, 32 m. S.W. of Edinburgh and 31 m. S.E. of Glasgow. Lanark is a co. constituency. The chief buildings are those

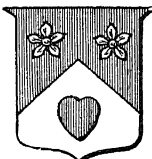
erected for burgh and county purposes, e.g. hospitals, a library, and an orphanage. The industries include hosiery making, tanning, fellmongery, and trade in horses, cattle, sheep, and agricultural produce. Founded in the 9th century or earlier, Lanark had a monastery

that was important under the early kings, and obtained a charter of incorporation about 1200. At New Lanark, a mile away, are the cotton mills which Robert Owen attempted to conduct on reformed lines. Lanark is noted for its picturesque surroundings. Near are the Falls of Clyde and Cartland Craigs. Lee House, the old seat of the Lockharts, is referred to in *The Talisman*. Market day, Mon. Pop. 6,178.

Lanarkshire. Inland county of Scotland, sometimes called Clydesdale. It is in the S.W. of the country, and its area is 879 sq. m. The chief river is the Clyde; others are its tributaries, Douglas.

Avon, Nethan, Cart, Kelvin, and the Calder. The surface is mainly flat and fertile, but in the S. there are hills; the Lowther Hills have peaks over 2,000 ft. high, while Tinto Hill is another elevation. In the N. is a rich mineral area, which has made the county the greatest industrial area in Scotland. The chief industries are mining and agriculture. Owing to the development of the former, Lanarkshire is the most thickly populated county, containing about a third of the Scots. There are many dairy farms and orchards, while vegetables and small fruit are grown. Cattle and sheep are reared and Clydesdale horses are noted. There are good transport services by rail and canal.

Lanarkshire is divided into three wards, upper, middle, and lower; in the lower ward is much of the great industrial area that centres in Glasgow. Lanark is the county town, but Glasgow is much the largest; Partick and Govan were absorbed by it in 1912. Other



Lanarkshire arms



Lanarkshire. Map of the Scottish county sometimes called Clydesdale, in which is situated the principal industrial area of the country

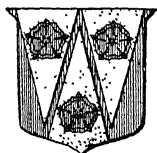


Lanark burgh arms

towns are Rutherglen, Motherwell, Airdrie, Wishaw, Coatbridge, and Hamilton. The scenery in the upper valley of the Clyde is of remarkable beauty. Lanarkshire contains Roman and other antiquities, and is associated with many events in Scottish history, herein being Langside, Bothwell Brig, and Drumclog, also the castles of Douglas, Craignethan, and Bothwell. Craignethan is said to be the Tillietudlem of Old Mortality. The co. has six M.P.s, apart from the burghs. Pop. est. 1,593,000.

LITERARY ASSOCIATIONS. William Lithgow (1582-1645), who wrote a notable early travel book, *The Rare Adventures and Painful Peregrinations of William Lithgow*, was born and died at Lanark. Leadhills was the birthplace of Allan Ramsay; Blantyre of David Livingstone; Bothwell of Joanna Baillie. Michael Scott, author of *Tom Cringle's Log*, was born in Glasgow, as was William Black, the novelist. Scott's biographer, Lockhart, was born at Cambusnethan. Literary figures who have lived in Glasgow or been associated with its university are Adam Smith, educated at the university and lord rector; Thomas Campbell, born in Glasgow, educated at the university, thrice lord rector; Tobias Smollett, apprenticed to a Glasgow apothecary. Lord Kelvin's life work was also associated with the university.

Lancashire. Maritime county of England. Its area is 1,875 sq. m. With a long and irregular coastline



Lancashire arms

on the Irish Sea, it is broken into two unequal parts by Morecambe Bay; the detached N.W. part is known as Furness. In the E., where Lancashire borders on Yorkshire, the surface is mountainous, Pendle Hill being over 1,800 ft. high. In the N.W. the mountains of the Cumbrian group enter it, Conistone Old Man being 2,633 ft. high, while lesser elevations of the Pennine Chain cover much of the centre. The level areas are in the south and along the coast.

The rivers nearly all flow W., the most important being the Mersey, Ribble, and Lune. Others are the Wyre, Irwell, Calder, and Darwen. The only large lake is Conistone, though the county borders Lake Windermere. Off the coast is the island of Walney. There is much agriculture, especially in the S.W., but much of



Lancashire. Map of one of the chief industrial counties of England

the county is an industrial area, while in the E. is some moorland. Standing on a great coalfield, S. Lancashire is covered with a network of populous towns, of which Manchester and Liverpool are the chief. They include Ashton-under-Lyne, Oldham, Blackburn, Salford, Bolton, Burnley, Bury, Rochdale, Bacup, Preston, Bootle, Warrington, Widnes, St. Helens, and Wigan. In the county, too, are Accrington, Chorley, Clitheroe, Colne, Darwen, Eccles, Heywood, Middleton, Mossley, Nelson, and Rawtenstall. Watering-places line the coast; in addition to Southport and Blackpool these include Morecambe, Fleetwood, and Lytham-St. Anne's. Lancaster is the county town. Barrow-in-Furness, outside the main industrial area, grew rapidly. The county's main industry is the cotton manufacture, but there are many others,

especially those included in the engineering and machinery group. Nevertheless, the smaller towns which had been built around the cotton industry were badly affected by the depression in that industry during the period between the two Great Wars, and their populations suffered a decline. Lancashire is in the London Midland region of British Railways, and is well served by main lines and by several canals, especially the Manchester Ship Canal. In addition to the 48 returned by the boroughs, it sends sixteen members to parliament. In the dioceses of Manchester, Liverpool, and Blackburn; from 1541 to 1847 it was in that of Chester.

The Lancashire man of the industrial areas is known to the rest of the country for his shrewd sense of material values and for his somewhat grim humour.

Lancashire comedians of the type of George Formby and Gracie Fields have a unique appeal, and have helped to perpetuate the Lancashire dialect and accent and to establish it as an integral component of English character. Lancashire cricket, too, can be as grim and formidable as Lancashire humour, yet as essentially good-tempered.

Lancashire is a county palatine, and as duke of Lancaster the king appoints its sheriff. It grew out of the honour of Lancaster created by Henry I. After being in the hands of the king, this was given by Henry III to his son Edmund, who was made earl of Lancaster. The county, first mentioned as such in 1169, was made a county palatine by Edward III, for his son John of Gaunt, who married the heiress of an earlier duke of Lancaster. There was a good deal of fighting here during the Civil War and some during the Jacobite risings in 1715 and 1745. The forests, which once covered much of the county, have disappeared. Lancashire has many families of ancient lineage and many stately mansions, *e.g.* Knowsley. It is also known for the strong R.C. element in its population. It contains the ruins of Furness Abbey, but had never a large number of religious houses. The pop. of 5,039,455 is the largest of any English county.

LITERARY ASSOCIATIONS. John Collier, famous as the 18th century dialect poet, Tim Bobbin, was born at Urmston, died at Milnrow, and is buried at Rochdale, where was born his successor in Lancashire dialect poetry, Edwin Waugh. Archbishop Sandys, one of the translators of the Bishops' Bible, was born as Esthwaite. Swarthmoor was the home of George Fox. William Whewell was born at Lancaster; De Quincey at Greenheys, Manchester. Wordsworth, who went to school at Hawkshead, found inspiration for much of his poetry in the N. of the county. Bamford, the weaver-poet, was born at Middleton and died at Harpurhey. Ruskin lived at Brantwood, near Coniston, for many years. Among stories with a Lancashire background may be mentioned Mrs. Gaskell's North and South,

and Mary Barton, and M. E. Francis's In a North Country Village. Manchester, perhaps, figures more largely as a fictional background than the rest of the county. It is the Coketown of Dickens's *Hard Times*, the Smoke-over of books by L. P. Jacks, the Doomington of Louis Golding's novels, and is described in books by Howard Spring and J. L. Hodson, and in C. E. Montague's *A Hind Let Loose*. But industrial Lancashire generally is depicted grimly enough in such novels as Walter Greenwood's *Love on the Dole* and in the plays of Stanley Houghton (*e.g.* *Hindle Wakes*), Allan Monkhouse, and Harold Chapin. Most of the authors here named were either Lancashire-born or had close connexion with the social life of the county.

Lancashire Fusiliers. Regiment of the British army. Raised in 1688 as the 20th Foot, it first saw service in Ireland and later went to the Iberian Peninsula in fulfilment of the British treaty with Portugal. It was at the siege of Gibraltar in 1704, at Dettingen, 1743, Culloden 1746, and was one of the six British regiments at Minden in 1759. It served for the remainder of the Seven Years' War, and took part in the American War of Independence. The regiment was with Abercromby in Egypt, and in the Peninsula distinguished itself at Corunna, where it covered the retreat. On garrison duty at St. Helena, it provided the bearer party at Napoleon's funeral.

Serving throughout the Crimean War, the regiment gained battle honours at the Alma, Inkerman, and Sebastopol. In the Indian Mutiny the Lancashire Fusiliers

were at Lucknow. In Africa they won the honour Khartum, fought at Omdurman, and took part in the relief of Lady-smith.

Thirty battalions of the Lancashire Fusiliers were raised for the First Great War, and amongst the battle honours were: Retreat from Mons; Aisne, 1914, '18; Ypres, 1915, '16, '18; Somme, 1916, '18; Gallipoli; Arras; Macedonia; Passchendaele; Cambrai; Hindenburg Line. At Gallipoli two gallant landings are commemorated as the Lancashire Landings. The 19th battalion was almost wiped out at Mt. Kemmel in April, 1918. In the Second Great War, the regiment served in Burma, Africa, and Italy. Its depot is at Bury.

Lancaster. A type of bomber aircraft designed by A. V. Roe & Co. (Avro), the outstanding R.A.F. aeroplane in the heavy class during the Second Great War. It had four Rolls-Royce Merlin or Bristol Hercules engines, and could carry a load of ten tons (or one 22,000-lb. bomb). With a smaller load its extreme range was 3,000 m., and top speed 275 m.p.h. Wing span was 102 ft., and the fuselage, which housed three power-driven gun turrets, was 69 ft. 4 ins. in length. Introduced in 1942, the Lancaster (*see illus. p. 129*) was henceforth the spearhead of every night raid; it took part in notable daylight operations at Augsburg, April 17, and Le Creusot, Oct. 17, of that year. The Lancastrian (*see illus. p. 130*) and York transports and the Lincoln (*q.v.*) bomber were based on this design.

Lancaster. Municipal borough, river port, and market town of Lancashire, England, also the county town. It stands on the S. side of the river Lune, 4 miles from the sea, and is served by main line rly., being 230 m. N.W. of London. A canal connects it with Preston, 21 m. S., while another goes across the Lune to Kendal. On an eminence commanding fine views over the valley and bay stand the chief of the old buildings, S. Mary's church



Lancaster, Lancashire. Parish church of S. Mary. Top, right, gateway of the 11th century castle
Frith

and the castle. The former is mainly Perpendicular; the latter was begun about 1094, from which period the Lungess tower dates; it was strengthened by John of Gaunt, and restored later. Features are the four towers, gateway, and keep. The castle is now



Lancaster arms

used as law courts. There are a town hall, given by Lord Ashton in 1909, an infirmary, public library, and observatory. The Storey Institute contains the art gallery, technical college and school of arts. In Williamson Park is a memorial to the family of Lord Ashton. The royal grammar school is housed in a modern building. The R.C. cathedral, 1859, is a bishop's seat. Lancaster is a co. constituency.

Lancaster has spinning mills and engineering works, but the chief industries are making linoleum, furniture, rayon, and plastics. There is some shipping and ship repairing, but large vessels can reach only to Glasson, 5 m. down the Lune estuary. Lancaster was a Roman station, hence its name. It was given in 1267 to Edmund, who was created earl of Lancaster, and was soon a corporate town. William Whewell was born here. Market days, Wed., Fri., Sat. Pop. est. 50,610.

Lancaster. The county seat of Fairfield co., Ohio, U.S.A. On the Hocking river, 31 m. S.E. of Columbus, it is served by the Hocking Valley and other rlys. Natural gas, coal, and oil occur near; the district is agriculturally prosperous; and the city makes boots and shoes, glass, agricultural equipment, and has rly. shops. It was settled in 1800 by Ebenezer Zane, incorporated 1831, and made a city 1851. Pop. 21,940.

Lancaster. A city of Pennsylvania, U.S.A., the co. seat of Lancaster co. About 70 m. W. of Philadelphia, on the Conestoga, it is served by rlys. and an airport. Here are Franklin and Marshall college, united 1852; a seminary of the Reformed Church, 1871; a Lutheran church, 1736; and a city hall, 1795. A city since 1818, Lancaster was settled a century earlier, and the national capital for one day, Sept. 27, 1777, was during 1799-1812 the state capital. It has stockyards, and makes cotton and silk goods, umbrellas, iron and metal products, and cigars. Pop. 61,345.

Lancaster, Duchy of. English duchy established in 1362. The

estates originated in lands granted to Edmund Crouchback, second son of Henry III, created earl of Lancaster in 1267. John of Gaunt, who married Blanche, sole heiress of the Lancastrian lands, was created duke of Lancaster in default of male heirs. After the defeat of the Lancastrians at Mortimer's Cross in 1461, the duchy was sequestered to the crown by Edward IV, since when it has been united with the crown, but administered separately by its chancellor as a private inheritance for the sovereign's benefit. It is one of the estates not surrendered with the rest of the crown lands by William IV. The chief estates are in London and the north of England; the net revenues are paid annually to the king, the anticipated yield being taken into account when parliament fixes the civil list. The office of chancellor is a political appointment usually held by a member of the cabinet. Until 1873 the duchy had its own law court. See Cornwall, Duchy of.

Lancaster, House of. Name given to the descendants of John of Gaunt, duke of Lancaster, the family reigning in England from 1399 to 1461. In 1267 Henry III created his second son, Edmund, earl of Lancaster. Edmund's son was Thomas, earl of Lancaster, the baronial leader against Edward II, and then came his brother Henry. Henry's son, a second Henry, was made in 1351 duke of Lancaster, the second creation of this kind in England, and his daughter married John of Gaunt, who was also made duke of Lancaster. By this time the estates of the dukedom were large and valuable, and their seizure by Richard II was an event in English history. Gaunt's son Henry, then in exile, sailed for England and in 1399 was crowned king as Henry IV. When his grandson, the deposed Henry VI, was killed in 1471, the male line of the house became extinct.

The title of the house of Lancaster to the throne was not perfect. Henry IV put forth a claim, clearly false, that Earl Edmund of Lancaster, and not Edward I, was the elder son of Henry III and that he (Henry) was Edmund's heir. But this being ruled out, the succession lay with the descendants of Edward I, i.e. with the family of his grandson Edward III. Richard

II, the grandson of Edward III, was childless and also without brothers, and the laws of succession, not then precise, pointed to the earl of March as the heir to the throne, he being the grandson of Lionel, duke of Clarence, who was older than his brother, John of Gaunt. On this ground, the Yorkists asserted that Henry IV was not the rightful king, who was to be found among the descendants of Lionel. His only daughter had married Edmund Mortimer, earl of March, and their granddaughter and heiress Anne became the mother of Richard of York.

The Lancastrian reply to this was that descent through a woman was invalid. The duke of York's claim was of this kind, and therefore Henry IV and his successors, who traced their descent in the direct male line, were the rightful kings. More practical, and also in accordance with precedents, was the argument that a strong adult, such as Henry IV, was preferable to a child such as Edmund of March was in 1399. See England: History; York; consult Lancaster and York, Sir J. H. Ramsay, 1892.

Lancaster, Henry, Duke of (c. 1300-61). English soldier and prince. Born probably at Gros-mont, he was the son of Henry, earl of Lancaster, who was a great-grandson of Henry III. His life was full of battles, on sea, on land, in the lists, and with rival diplomatists. In 1336 he commanded an army in Scotland, where he had served earlier. In 1345 he led the English troops in Aquitaine with much success; in 1356-57 he was fighting in Normandy and Brittany. He won fame at Sluys and other sea fights, had much to do with arranging the treaty of Bretigny, and went on embassies to Avignon and elsewhere. Henry's first title was earl of Derby; in 1345 he succeeded to his father's earldoms of Lancaster and Leicester, and in 1351 was made a duke. He died May 13, 1361, leaving no sons.

Lancaster, John of Gaunt, Duke of (1340-99). An English prince. The fourth son of Edward III, he was born at Ghent, whence his name. In 1359, having already seen fighting in France, he was married to his cousin Blanche, daughter of Henry, duke of



Duchy of Lancaster arms



Henry, Duke of Lancaster

Lancaster, and so acquired three years later that richly ducky. Previously he had been known as earl of Richmond.



John of Gaunt,
Duke of Lancaster

He fought in France and from 1367 in Spain, where he helped to restore Pedro to his throne of Castile. This led to his second marriage, with Pedro's daughter, Constance, and to efforts to secure that kingdom for himself. In 1386 at last he gave up his claim to his daughter Catherine, who married the rival claimant, Henry.

In England, John's vigorous personality made him prominent, especially in the last illnesses of Edward III and the Black Prince. The Good Parliament that met in 1376 regarded him as chiefly responsible for the deplorable condition of the kingdom; but he was too strong for his enemies. Disliked by the higher clergy, he made common cause with Wycliffe, protecting the Lollards from the anger of the Londoners.

During the reign of Richard II, John was a conspicuous and usually an unpopular figure. The character attributed to him by Shakespeare in Richard II is idealised. His adventures in Spain brought no glory; the courtiers hated his influence over his nephew the king; made duke of Aquitaine in 1395, he was an unfortunate ruler there. He presided over the trial in 1397 of the earl of Arundel. The banishment of his son, soon to be Henry IV, darkened Gaunt's last years, and he died Feb. 3, 1399. His third wife was Catherine Swynford, by whom he was the father of the Beauforts. See Hauberk; consult John of Gaunt, S. Armitage-Smith, 1904.

Lancaster, THOMAS, EARL OF (c. 1280-1322). English baronial leader. Son of Edmund, earl of Lancaster, and a grandson of Henry III, he became earl of Lancaster and Leicester in 1296. He married the heiress of the earl of Lincoln, and, after the accession of his cousin Edward II, took his place as the leader of the discontented barons. He was strong enough to bring about first the banishment and then the death of Gaveston. From 1314, after Bannockburn, he again took charge of affairs, but hostility between Edward and the earl came to civil war in 1322. Thomas was taken prisoner at Boroughbridge,

and was executed at Pontefract, March 22, 1322.

Lancaster, JOSEPH (1778-1838). British educationist. The son of a private soldier, he took a large room in the Borough Road, London, in 1801, and established a school for poor children, which he conducted on the monitorial principle of setting the elder scholars to teach the younger. Managed on undenominational lines, it developed by 1808 into the Royal Lancasterian Society,



Joseph Lancaster,
British educationist
After Hazlitt

Lancaster House. A London mansion, at the S.E. corner of the Green Park. Built by Wyatt about 1825 for the duke of York, second son of George III, and known first as York House, it was sold to the 2nd duke of Sutherland in 1841 for £72,000. It was thenceforward known as Stafford House. The upper storey was added by Barry, who designed the grand staircase and the interior decorations. Notable for its picture gallery, Stafford House was purchased by Sir W. H. Lever (later Lord Leverhulme) in 1912, renamed Lancaster House, and presented to the nation as a home for the London Museum (*q.v.*).

It was closed on the outbreak of both Great Wars, but a few exhibits were placed on view in 1942, and in 1943 it housed an exhibition to celebrate the 1900th anniversary of London's foundation. In 1944 it was closed again because of the flying bomb attacks. Used for meetings of the European advisory committee, it was later taken over by the Foreign office and was used for various international conferences including the abortive meeting of the council of foreign ministers of the U.K., France, the U.S.A., and Russia in December, 1947.

Lancaster Regiment, KING'S OWN ROYAL. Regiment of the British army. Raised in 1680 as the 4th Foot,



it garrisoned Tangier, which had become a British possession in 1661. In 1686 it was given the title of The Queen's in honour of James II's wife. In 1688, however, it declared for William III and went to Ireland, later serving at Steinkirk and Landen in Flanders. Its first battle honour was won at the taking of Namur in 1695, when it gained its present badge, the British lion. In the reign of Anne it was reformed as the Queen's Marines, and served under Rooke at the capture of Gibraltar. The title of King's Own was conferred by George I. The regiment served throughout the American War of Independence and against the French in the West Indies in 1778. In the Peninsula it was with Moore at Corunna. In 1814 it was again in America, but returned to Europe in time to fight at Waterloo. Three battle honours were gained in the Crimea, two in the Indian Mutiny, and in 1863 the regiment



Lancaster House, London. Garden front, facing the Mall, of the building long used for the London Museum

was with Napier in Abyssinia. It served throughout the Zulu War of 1879, and in the S. African War was at the relief of Ladysmith.

Sixteen battalions of the Lancaster Regiment served in the First Great War, among its battle honours being Marne, 1914; Ypres, 1915, '17; Somme, 1916, '18; Arras, 1917, '18; Messines, 1917; Lys; Macedonia; Gallipoli; Mesopotamia, 1916-18. The title, The King's Own Royal Regiment (Lancaster), was granted in 1920. In the Second Great War the regiment took part in the N. Africa and Italy campaigns, and formed part of the force that held Leros.

Lancaster Sound. Channel of British North America. It connects Baffin Bay with Barrow Strait, running E. and W. for about 300 m. It is within the Arctic Circle, and was discovered by Baffin in 1616.

Lancastria. A British ship. Owned by the Cunard line, she displaced 16,243 tons, and became a troopship in the Second Great War. On June 17, 1940, while lying at anchor in St. Nazaire harbour, she was sunk by German dive-bombers. Of some 5,000 on board, B.E.F. personnel and French refugees, only 2,477 were rescued.

Lance-Corporal. Lowest non-commissioned officer appointment in the British army. Promotion from private to acting lance-corporal carries no extra pay, but lance-corporals on the establishment of a unit receive an increased basic rate. They are designated lance-bombardiers in the Royal Artillery. They wear a single chevron on each sleeve.

Lancelet or *AMPHIOXUS*. Small marine creature, forming the class Cephalochordata. From 1½ ins. to three inches in length, the lancelet, found in salt water near the coast, resembles a flat and silvery fish, pointed at both ends, as the name suggests, and is remarkable as being in some ways the most primitive of the chordates. It has no skull or distinct brain, no jaws, heart, ears, eyes, or limbs, but it possesses the notochord characteristic of vertebrates. It is found widely distributed, and feeds on microscopic organisms. The creature owes its importance in science to its being a link between vertebrates and invertebrates.

Lancelot. A character in the *Morte d'Arthur*, generally known as Sir Lancelot of the Lake. The chief of the Knights of the Round Table, he is described as one not to be overcome except by enchantment. From his illicit love for Guinevere, Arthur's queen, resulted the last battle, in which the king fell. Lancelot then took the habit of a monk, and shortly after the death of Guinevere he also died, and was buried at Joyous Gard—either Alnwick or Bamburgh. See *Morte d'Arthur*.

Lancer. Mounted soldier armed with a lance. The latter is one of the oldest military weapons. The Assyrian and Egyptian armies included squadrons of lancers, but amongst the Greeks and Romans there was no distinction between lance and spear. In the days of chivalry, a heavy lance some 16 ft. long was the chief offensive weapon

of the mail-clad knight. With the development of firearms, the lance declined in importance, and after the disastrous defeat of Spanish lancers by English carabineers in the Netherlands in 1597, the weapon was rarely used. In 1650, however, Cromwell's troops suffered severe casualties when attacked by Scottish lancers at Dunbar, and five years later at San Domingo Spanish lancers beat English cavalry armed with swords. By the beginning of the 18th century, the only troops preserving lances were Poles and Cossacks, who had successes against Frederick the Great. Lancer troops were introduced into Prussian hussar regiments in 1744.

Modern lancer regiments date from 1807, when Napoleon raised Polish units; four years later he converted into lancers nine French dragoon regiments, which did well at Waterloo. As a result the British war office in 1816 converted the 9th, 12th, and 16th Light Dragoons into lancers. The 17th Light Dragoons were similarly changed in 1822 and the 21st Hussars in 1896; the 5th Dragoons, disbanded in 1799, were re-formed in 1859 as the 5th Lancers. Full-dress uniform of these regiments perpetuated the Polish origin in the distinctive square cap.

Until 1918 all German cavalry was armed with the lance, and in most other armies, except those of the U.S.A. and Japan, every cavalry division included a proportion of lancer regiments. Even in 1939 the greater part of the Polish horsed cavalry bore lances.

As introduced into the British army in 1816, the lance was 16 ft. long and had a small Union flag below the point, but in 1829 the length was reduced to 9 ft. 1 in., while a red and white pennon replaced the flag. As to British actions of the 19th and 20th centuries, the 16th Lancers distinguished themselves in the Indian Mutiny, and the charge of the 21st at Omdurman in 1898 demonstrated the value of the weapon against savage troops. The 5th Lancers made a deadly charge and pursuit of the Boers at Elandslaagte in 1899. The First Great War provided few opportunities for using the lance; the charges of the 12th Lancers at Cérizy and the 9th at Moncel were instances in France. The 21st made a useful charge against the Mohmands on the N.W. Frontier of India, and the 2nd Indian Lancers routed the Turks at Lejjun in Allenby's final advance. Other lancer regts. fought as infantry.

With the reduction of British cavalry in 1922, the lancer regiments were reduced to four, by amalgamation of the 16th and 5th, and the 17th and 21st. In 1927 an army order abolished the lance except for ceremonial purposes. British lancer regts. ultimately became units of the Royal Armoured Corps.

Lancers. A square dance for eight people. It is in five figures, each consisting of several steps. It was invented in Paris in 1836 and introduced into London in 1850, where it soon became popular, and was adopted at court ten years later. It rarely now appears on ballroom programmes, except as an "old-time" dance, for at the beginning of the 20th century the steps were generally changed into a succession of waltzes, and the dance degenerated into a romp.

Lance-Sergeant. Former non-commissioned officer rank in the British army, intermediate between corporal (or bombardier in the Royal Artillery) and sergeant. He wore sergeant's chevrons, but the pay was on a corporal's scale. The R.A. lance-sergeant was not entitled to wear the full sergeant's gun emblem above his chevrons.

Lancet, THE. London medical newspaper. It was founded Oct. 5, 1823, by a surgeon, Thomas Wakley (1795-1862), to report medical lectures and hospital cases and to reform hospital management. An early assistant on the paper was Cobbett. Recognized as a leading authority on all subjects connected with medicine and surgery, *The Lancet* has included among its contributors eminent British and foreign scientists.

Lancewood (*Duguetia quitarensis*). Tree of the family Anonaceae, native of S. America. The wood, owing to its light, elastic character, is used for making the shafts of light vehicles.

Lanchester. Village and parish of Durham, England. It is 8½ m. N.W. of Durham, with a rly. station (N.E. region). All Saints, an old church, has some Norman work, and was made a collegiate church in 1283. The main occupation of the inhabitants is in coal mines. On a hill above the village are remains of a Roman station, hence its name. From this altars, coins, inscriptions, and other antiquities have been unearthed. The materials therefrom were used in building the church and many houses. Pop. 5,200.

Lanchester, FREDERICK WILLIAM (1868-1946). A British engineer. He was born Oct. 23, 1868,

and trained at the Royal College of Science. The first British petrol-driven motor car, which he put on the road in 1896, contained an epicyclic gearbox, balanced engine, valve gear, and steering mechanism. The Lanchester manufacturing company began in 1899 and its founder was active in the industry till 1930. Also a pioneer in aerodynamic theory, he carried out studies on the behaviour of aerofoil sections, joined the advisory committee for aeronautics in 1909, and published *Aerial Flight*, 1907. On March 8, 1946, he died in Birmingham.

Lanchow OR KAOLAN. Capital of Kansu prov., China. It stands on the right bank of the Yellow river, here 300 yds. wide, in the centre of a basin-like valley surrounded by high hills. The town is noted for its tobacco industry. The Great Wall here follows the left bank of the river for many miles. Est. pop. 680,000.

Lanciano. A city of Italy, in the prov. of Chieti. The ancient Anxanum, it is 12 m. S.E. of the city of Chieti, with a station (San Vito) on the coast rly., 8 m. to the N.E. It has an ancient cathedral and the remains of a Roman theatre. There are hemp, silk, and linen factories, and a trade in grain, oil, and fruit. Pop. 19,900.

Lancing. Parish and village of Sussex, England. It stands on the coast 2 m. E. of Worthing, with a station on the electrified rly. There is a church dating in part from Norman times. S. Nicholas College, usually known as Lancing College, is the senior of the schools founded in 1848 by the Rev. N. Woodard. It has accommodation for 350 boys, and is conducted on Anglican lines. Its chief feature is the large Gothic-style chapel externally unfinished. Pop. 4,698.

Lancret, NICHOLAS ((1690-1743). A French painter. Born in Paris, Jan. 22, 1690, he studied under Pierre D'Ulin and Claude Gillot, but derived his main inspira-

tion from Watteau. In 1719 he was admitted to the Academy as a painter of *fêtes galantes*, and in 1735 became a member of the council, attracting the notice of Louis XV, who commissioned six pictures for Versailles. His pictures had not the depth or richness of Watteau's, but he was an extremely clever and painstaking artist; his manifold Scènes Champêtres, if somewhat artificial, were based upon years of study.



Nicholas Lancret. Camargo Dancing, an example of this French painter's work, in the Wallace Collection, London

He died in Paris, Sept. 14, 1743. The Wallace Collection, the National Gallery, and the Louvre possess good examples of his art.

LAND AND THE LAND LAWS

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The history of land laws in England is here given down to the passing of the group of Acts in 1925 which revolutionised them. See also Commons; Feudalism; Land Values; Manor; Rent; Single Tax, etc.

The word land means primarily the solid, dry part of the earth's surface, as opposed to the area covered with water. It is also used as a synonym for a country. Its most frequent use, however, is for the soil on which men live and work, from which ultimately all the requirements of the human race are supplied. This divides itself into two main aspects—production from the soil, and the division of that produce. Connected with the second aspect is the question of ownership and interests in land.

Private property in land assumed importance only when the population of the earth turned from pastoral to agricultural pursuits, and occupation of land became the source of virtually all wealth. It would seem that for long periods of time land was regarded rather as the property of the clan

than of an individual or family, and cultivation of the land by individual owners is a comparatively recent development in human society. For many centuries, it was a communal enterprise, carried on often by the village, and this method of cultivation is by no means extinct in Asia and Africa. In W. Europe, however, feudalism, under which land was held from an overlord in return for services, was superimposed on primitive methods of landholding. Feudalism affected land law in the chief nations of W. Europe, including England, where all land holding was feudalised at the Norman Conquest.

FEUDAL LAND LAW. The feudal system had made some headway in England in later Saxon times; the Norman Conquest extended it to the whole of the land. The king became the only owner of land in the kingdom. All other landholders were, in strictness, tenants, holding their lands in return for feudal services. Of tenures, there were various kinds, these being divided into (a) free tenures, and (b) unfree tenures.

Free Tenures. These were again divided into two main types: (1) military tenures, and (2) non-military tenures. Military service was early commuted for the payment of a fixed sum of money, termed scutage (shield money), which, with the decline in the value of money, ceased to be collected.



Lancing, Sussex. View of Lancing (St Nicholas) College showing the large unfinished Gothic-style chapel on the right

There were various kinds of military tenure, some of them being regarded as particularly honourable. Grand serjeanty involved the performance of some distinctive service to the king. There was also an ecclesiastical counterpart to military tenure, known as *frankalmoin* (i.e. free alms), in which ecclesiastical services such as saying masses for the overlord took the place of military service. Besides the liability to military service, tenants in knight-service also owed homage and suit of court to the overlord, they were compelled to pay the three customary aids (to knight the overlord's eldest son, to provide a dowry for his eldest daughter, and to ransom the overlord's person), and their lands were subject to various burdensome incidents such as wardship (the right of the overlord to the possession of the tenant's lands during a minority), marriage (the right to award an infant female, and perhaps an infant male, tenant in marriage), escheat (i.e. forfeiture on failure of heirs), and (where the tenant held directly of the crown) *prima seisin* (i.e. the right of the overlord to take the first year's rents on a succession to the fief).

Socage and Fee Simple

Of the non-military tenures, the most important was socage, in which the chief liability was to pay a fixed annual sum to the overlord. With the fall in the value of money, this sum ceased to be collected, and so in course of time, socage approximated more and more to absolute ownership. With the abolition of military tenures in 1660 (except for the ceremonial incidents of grand serjeanty) all free landholding came to be indistinguishable from socage.

Various estates, known as freehold estates, could be enjoyed in land held in free tenure. The widest was the fee simple, an estate which descended to the tenant's heirs general, no matter how remote but determined in accordance with rules of descent based upon primogeniture. For some time after the Conquest land could not be alienated, either on death or in the tenant's lifetime; but the tenant could in practice achieve the same end by subinfeudation, i.e. by creating a fee subordinate to himself of either part or the whole of the land. Subinfeudation was prohibited by the statute *Quia Emptores* in 1290, which also allowed tenants to sell the whole or part of their lands. At law, however, alienation of land

by will was impossible until the Statute of Wills, 1540.

Other estates in freehold land were the life estate (i.e. an estate which endured only for the life of the person to whom it was granted), the estate *pur autre vie* (an estate which endured for the life of some other person), and the fee tail (i.e. the *fee taillé* or cut-down estate), which passed to the actual descendants of the donee in accordance with the rules of primogeniture.

Unfree Tenures. Within the orbit of the feudal system, there was a class of villeins who, whilst not being slaves, were tied to the land of a manor. The villeins performed the menial work of a landed estate, and in return they received grants of land from the lord of the manor. For some time these holdings of land were purely at the will of the lord, but gradually they were governed by manorial custom, and the villeins enjoyed estates in the land somewhat resembling the non-military estates which existed in freehold land. Gradually, too, the services in respect of which the lands were held were defined by feudal custom, and the villein-tenants won the right of alienating their lands, both in their lifetime and by will. Thus, a freeman might hold lands in villeinage, and with the disappearance of the status of villein in later Elizabethan times, villeinage ceased to denote a status, and was simply a form of tenure which, however, by this time was usually termed copyhold tenure, since the tenant's only evidence of title was a copy of the entry on the manorial roll, evidencing his title. (This form of land holding was abolished by the Property Acts, 1925.)

The Rise of Leasehold

At a later date there grew up outside the feudal system a third method of landholding, viz. by way of leasehold. The characteristic of a lease is that it is given for a definite and certain period of time, usually a number of years, and in origin leases seem to have been given as a security for a debt, the debtor accepting the use of land in lieu of interest. Little by little, leasehold came to be regarded as a distinct form of landholding, and if the tenant were ejected he could bring an action of trespass, and, if successful, he would be restored to possession of the land.

For a period after the Norman Conquest the only method of vindicating title to land held in feudal tenure was by means of trial by battle, i.e. judicial combat.

Although champions were permitted to fight in place of those incapable of defending their interests (e.g. women, infants, and the aged and infirm), this procedure was very unpopular, and in the reigns of Henry II and his successors, a number of alternative remedies, known as The Real Actions (because their object was the recovery of the *res*, the land) were introduced, triable by a number of adjoining landowners—*forerunners of the jury*. The Real Actions gradually became technical and cumbrous; they were abolished in the 19th cent.

CHANGES INTRODUCED BY EQUITY. The activities of equity (q.v.) were far-reaching in the land law, where the operation of feudal doctrines was felt to be increasingly burdensome as the social conditions on which they rested passed away. This accounts for the popularity of uses and trusts, which were protected in the court of chancery, although the common law refused to give legal effect to them.

"Cestui que use"

A use arose where a person (termed the feoffor, i.e. the grantor) transferred land to another (termed the feoffee to uses) for the use of a third (termed the beneficiary or *cestui que use*). The essence of the transaction was that the feoffee became the full legal owner of the land, although he was bound in conscience to use the land for the benefit of *cestui que use*. The reasons leading to the employment of this device were varied. The beneficiary might be a religious corporation, prevented by the Statutes of Mortmain or by the rules of its own order from owning land. More frequently, however, *cestui que use* was an infant or a woman. Now, if the legal owner (the feoffee) were of full age, the burdensome incidents of wardship and marriage would not attach to the land, and so the infant or female beneficiary would go free. Again, although a feudal tenant could not make a will at law until 1540, if he transferred his land to a feoffee to uses, to hold to the uses of a will, the will would take effect behind this transfer of the legal estate. The difficulty, however, was that the common law courts refused to recognize the binding nature of the use, so that if the feoffee refused to give effect to it the beneficiary was without a remedy at law. At this point, however, the court of chancery intervened, and compelled the

feoffee to carry out the use. In this way there grew up behind the legal estate, through the intervention of a use, a second method of landholding which, being equitable in nature, ignored many of the feudal doctrines of the common law. Thus, for many centuries there were in effect two distinct, but connected, systems of land law which might be applicable to a piece of land—the feudal common law, applicable to all land held in feudal tenure, and equitable rules which were applicable to equitable interests held through the intervention of a use. In 1535, there was passed the Statute of Uses, the object of which was to abolish uses, but after the lapse of a century, they arose under the name of trusts.

The Law of Mortgages

Besides the enforcement of uses and trusts, equity was responsible for another change in the land law, by its intervention of the law of mortgages. A mortgage of land is, in reality, a transfer of the ownership of the land from the borrower to the lender, to give a security for the repayment of a debt, but the borrower remains in occupation of the land. In the Middle Ages the mortgage was effected by a deed, by virtue of which title was transferred to the lender, and the borrower agreed to repay the money and interest at a specified future date (usually six or twelve months ahead), failing which the land was to belong to the lender absolutely. The common law courts construed this obligation very strictly, so that if the borrower was not ready with his money at the specified date he lost possession of his property completely.

However, the court of chancery treated the transaction throughout as a loan on security, and after the legal date for redemption had passed the court allowed the borrower an indefinite future period in which to redeem his land. This further interest of the borrower in the land, existing only in equity, was known as the equity of redemption. It was a valuable equitable right which could be sold, be disposed of by will, or be transferred in other ways.

SETTLEMENTS. From the 17th century onwards a considerable amount of land in the country has been held through the intervention of family settlements, the primary object of which was to provide some income for every member of a family from the land, which, however, remained

as an undivided whole in the hands of the eldest lineal descendant, whose enjoyment of the land was therefore fettered by the existence of many other interests. For the purposes of the settlement it was, moreover, essential that the land should remain in the family, and this was achieved by giving only limited interests to each successive tenant, so that no single occupant of the land would ever be in a position to sell it and dispose of the proceeds.

Rule Against Perpetuities

Such a system, if completely successful, would have made the bulk of the land of the country the monopoly of a limited caste, and the policy of English law has therefore always been to set clear limits to the period during which land may remain inalienable. This has been achieved by the formulation of a series of rules, of which the most important is the rule against perpetuities, which prevents the tying-up of land beyond the period of a life or lives in being and twenty-one years afterwards (i.e. if the life chosen is a long one, a maximum period of about one hundred years). The existence of this, and allied rules, has governed the form of modern English settlements of land.

Suppose that a man aged forty-five, married, with two sons both bachelors, wishes to create a family settlement. He will do so by a document in which he limits his own interest in the land to a life estate. He will then give his eldest son a life estate, with a provision that a fee tail (since 1925, an entailed interest) shall be given successively to each of the sons of his eldest son. There will be a further provision that if his eldest son fails to have children, similar estates shall be given to his second son (and after him, to any other son) and his children. There will also probably be a provision that, during his elder son's lifetime a capital sum of money shall be raised for his second son, and on the settlor's death, his widow shall be entitled to an annuity of a certain amount out of the land. When the settlor dies, his eldest son will succeed, but he will be entitled to a life interest only, and on the birth of children to him it will be possible to carry the process a stage further by means of a settlement.

A moment's reflection will show that the existence of all these limited interests in the land not only operates as a fetter upon the transfer of the land, but also acts

as a clog upon its proper development. The tenant in possession has neither the incentive nor the capital to undertake long-term developments, nor is he in a position to give security of tenure to anyone else who is prepared to do so. To get over this a succession of Settled Land Acts was passed in the second half of the 19th cent. intended to give the tenant in possession wider powers, and this process was carried to its logical conclusion by the Settled Land Act of 1925. The latter gave the tenant in possession power to sell the land, but provided that the purchase money was to be held for the same purposes as the settled land had previously been.

PRIVATE CONVEYANCING. By the end of the 19th century (and in spite of many reforms during the previous half-century) the land law had become extraordinarily complex. Since it was achieved by means of a system of private conveyancing, the transfer of land was a slow, uncertain, and costly process.

Other Interests Affecting Title

Apart from legal and equitable estates, and the freehold, copyhold, and leasehold tenures outlined above, there existed a wide variety of legal and equitable interests in land, all of which might affect title to land. Of these interests, it is necessary to mention only easements (e.g. a right of way over land), profits (a right to take something from the land), restrictive covenants (restricting the uses of land), rentcharges and tithes (transformed into tithe rentcharge in 1836, and into terminable annuities in 1936). A purchaser would always be bound by legal interests affecting the land, whether he knew of them or not. He would be bound by equitable interests if he had actual notice of them, or if he would have obtained notice of them had he made proper enquiries. Thus, before any transfer of land could with safety be undertaken, it was necessary for the purchaser's solicitor to make an exhaustive investigation of title, which involved the perusal of all relevant documents of title. These, however, might well go back several centuries.

Accordingly, the 19th century legislation provided that a purchaser should not be affected by notice of interests arising more than 40 years (later cut down to 20 years) before the transfer, provided they were not contained in any later document of title. Even so, the number of possible

interests was still large, especially if title was derived from a family settlement.

THE PROPERTY ACTS, 1925. Simplification of the law of real property was embodied in a collection of property statutes, of which the chief were the Law of Property Act, the Trustee Act, the Administration of Estates Act, the Settled Land Act, the Land Charges Act, and the Land Registration Act, all passed in 1925. A considerable number of feudal doctrines were abolished altogether, including dower, escheat, and a number of other incidents. Copyhold tenure was also abolished, copyholds being converted into freeholds. A new order of succession was established for all kinds of property, the old law of descent for land, based on primogeniture, being abolished.

Expediting the Transfer Process

The number of legal estates in land was cut down, and the law relating to equitable estates was greatly simplified, with the object of making transfers of land speedier and less expensive. To carry out this purpose, the old idea of the separation of the legal estate from the equitable estate was put to a new use. Primarily, the purchaser was concerned only with the legal estate. Many equitable interests were placed, in the expressive phrase of the Law of Real Property, "behind the curtain," and since the purchaser was not allowed to draw aside this curtain, he was not concerned with them. They operated, after sale, not against the land, but against the purchase money, and it was not the purchaser's concern to see that effect was given to them. Other equitable interests, such as restrictive covenants, which still operated against the legal estate, were to be registered in a register of land charges, where they would be available for the purchaser's inspection. Thus, registration of interests replaced the cumbrous law of notice.

Land transfer is now easier and cheaper than it was, but it still compares unfavourably with the transfer of other forms of property, notably the transfer of stocks and shares. To some extent, this is due to the nature of land, since it permits the creation of many widely differing interests in it. It would be possible to make land transfer a good deal simpler still by an extension of the principle of registration.

LAND REGISTRATION. There are two quite different kinds of land

registration: (1) Registration of interests affecting land, put into effect by the Land Charges Act, 1925; where a land charge is directed to be registered, a purchaser is not bound by it (even if aware of it) unless it is registered. (2) Registration of title. This has been introduced with success in the British dominions and in many foreign countries. It has long been advocated in England, and a scheme for registration of title was introduced during the Commonwealth, but it failed to become law. In 1897, an Act was passed providing for voluntary registration of title, but comparatively little use was made of it. The Land Registration Act of 1925 carried the matter a stage further, for it provided that areas could be proclaimed compulsory registration areas, whilst retaining voluntary registration in other areas. Middlesex, Eastbourne, and Hastings were made compulsory registration areas. During the Second Great War, a committee considered the possibility of introducing land registration for the whole of England and Wales, but decided that this could not be done until an adequate map of the entire country existed. In the meantime, however, the

number of voluntary registrations is steadily increasing, and once a piece of land has been placed on the register, it cannot be taken off again. The advantages of registration of title are clear. If land is registered with an absolute title, the title possesses a state guarantee. Moreover, the process of investigation of title is very greatly simplified, for all dealings with the land which affect title are set out either upon the register of title or upon the register of land charges. Further, in place of the cumbrous system of transferring an entire collection of title deeds, there is substituted a land certificate, which has some resemblance to a share certificate.

Land (plur. *Länder*). German word meaning state or country. After her defeat in 1945, Germany was divided into 16 *Länder* or states, four each in the British and U.S. zones of occupation, three in the French, and five in the Russian; each *Land* having its own constitution, parliament, and government, subject to the authority of the federal govts. set up later in West and East Germany. The *Länder* varied in size from Bremen, with less than 500,000 pop., to North-Rhine Westphalia, with 12 million.

LAND ARMY, WOMEN'S: A NATIONAL SERVICE

Inez Jenkins, Chief Administrative Officer, W.L.A.

The history and organization of an important branch of national service carried out by women new to agriculture during both Great Wars, and continued after the Second

During the first years of the First Great War, women were trained for and placed in the lighter branches of farm work; but by 1917 a more comprehensive scheme became necessary, and the Women's Land Army, a mobile body of regular women land workers, came into being, organized under a special women's branch of the ministry of Agriculture. Free training with maintenance was arranged for a period of four to six weeks; working kit was provided free and a minimum weekly wage was guaranteed, this minimum rising to a figure of 25s. per week. This land army reached peak strength in Aug., 1918, when 15,974 women were at work. It continued in existence after the close of hostilities, being finally disbanded in 1920.

When war threatened in 1939, it was decided that a new Women's Land Army should be formed. Offers of service were invited, the organization was brought into being on June 1, 1939, interviewing

of applicants began, and arrangements were made for those who so volunteered to spend a fortnight or three weeks of their summer holiday on farms where they would get a practical introduction to land work. Some 1,500 girls received preliminary training in this way, and when war was declared nearly 1,000 of these were placed immediately in farm work, many on the farms where they had trained.

The organization of the second W.L.A. was again undertaken in England and Wales by the ministry of Agriculture. The administration is carried out through a headquarters office in London, working as a part of the ministry, and fifty sub-offices in the counties. The county offices of the land army work in close cooperation with the offices of the county war agricultural executive committees, the bodies responsible for carrying out the cultivation policy of the minister of Agriculture. In Scotland the organization of the land

army is on similar though not identical lines, and is the responsibility of the Scottish department of Agriculture.

A girl who volunteers for the land army is interviewed by at least two land army representatives. She is accepted for membership only if she appears physically and temperamentally suited to work on the land, if she is willing and able to give mobile service and to work away from home wherever she may be needed, and if she is passed after medical examination as fit and well. She is then provided with her working kit (breeches, shirts, green pull-over, overalls, milking coat, stockings, shoes, boots, gumboots, hat, sou'wester, and mackintosh or oilskin) and is either sent to an approved farm for a month's introductory training if she is destined for specialist work where some preliminary training is needed (e.g. milking or stock work), or direct to employment if she seems better suited to field or gang work. While in training a land girl receives a weekly personal allowance of 33s., while her training farmer receives 25s. per week to cover the cost of her board.

Conditions of Employment

A land army member is enrolled on the basis of a promise of service—during the war years for the period of the war, and after hostilities ended for a minimum of 12 months. Her only legal contract, however, is with her employer—war agricultural executive committee or private farmer—and this may be ended by either party at one week's notice. Approx. one half of the land army is employed by the various war agricultural executive committees, the rest by individual farmers or market gardeners. Girls who work for the committees live for the most part in hostels managed by the land army from which they go out to work daily in gangs either on committee lands in possession or, under contract, on nearby farms. Where a girl is placed in private farm employment, she lives on the farm or in a nearby village billet. Before she is posted to work, the farm is visited by a land army representative to ensure that it is a suitable place for a girl to work, and that the actual job is one of which a woman is capable. The billet is also inspected. After the girl has started work, she and her employing farmer are regularly visited by the land army representative, who also takes steps when the girl first arrives to

introduce her to other young people in the neighbourhood and to village activities.

In carrying out the regular visiting of employed members and arranging spare time recreational and educational activities, the land army has availed itself of much voluntary help. In each county a chairman and voluntary committee of eight has worked with the salaried staff in an advisory capacity, while over the whole of England and Wales some 4,000 part-time voluntary helpers have acted as local representatives.

From the start, the land army laid down standard working condi-



Land Army. A parade of W.L.A. members in working kit!

tions for its members and insisted on a guaranteed weekly wage fixed in 1939 at 28s. a wk. Later, the central agricultural wages board fixed minimum wage rates for all women working full time in agriculture, including land army members, and in 1947 the minimum wage rate for a woman worker of 21 years of age had risen to 68s. for a 48-hr. week.

The land army grew rapidly until by Aug., 1943, the employed strength in Great Britain reached 86,694. Girls were engaged on every type of farm and market garden operation as well as in pest destruction, land drainage, timber work, and forestry. They tackled with success jobs which it had not been expected that women could handle, and for the most part found real interest and happiness in their work. With the end of the war, a demobilisation scheme was introduced for the land army; under that scheme and subsequently many members returned to private life or to other

employment. A peace-time land army was, however, maintained until 1950. Its maximum strength (1945) was 54,000.

Landau. Four-wheeled horse carriage. It has the top divided, so that it may be closed, half-closed, or open. It is still used in state processions, etc., and is a comfortable vehicle of graceful design. It probably takes its name from the town in Bavaria (*v.s.*). The diminutive landaulet or landalette was sometimes used of a small landau or coupé, another term being a sociable. See Carriage.

Landau. Town of the Rhine-land Palatinate, W. Germany, from 1945 in the Fr. occupation zone. It is on the Queich, at the foot of the Hardt Mts., 30 m. S.S.W. of Mannheim. A free city of the empire from 1274, Landau was erected on the site of a Roman settlement. It shared the fate of the Franco-German borderlands, belonging to bishops, the empire, and the French, after many sieges and conquests, and was Bavarian from 1815. It was fortified by Vauban in 1688 and demilitarised in 1871. There are a 13th century Stifts church and a 15th century Augustinian church, with parts of the former monastery. Wine and tobacco production, shoe, furniture, and soap making, engineering, gardening, and cattle marketing were the industries, but Landau suffered heavily during the last stages of the Second Great War. Pop. 14,890.

Land Bank. Name given to a bank formed to lend money on the security of land. The establishment of one in England was suggested in 1648, and in 1696 one was really founded. The idea was that subscribers to the capital should hand over their land, and on the security of this notes should be issued, money lent to the government, and to individuals who pledged their land as security. This scheme was a failure. There were also attempts to found land banks in the British colonies in America early in the 18th century, but the practice was declared illegal in 1740. In 1911 a proposal, associated with the name of Sir Edward Holden, was put forward for a land bank for England and Wales, the idea being that with its aid agricultural tenants could buy their holdings. A land bank must be distinguished from an agricultural credit bank.

Land Charges. Rights and interests to which one person is entitled over land belonging to another. A person purchasing

land might not be able to discover the existence of these rights and interests from an examination of the title deeds of the land, yet it might be held that he had constructive notice of them, i.e. he might have discovered them by exhaustive inquiries. Then the land would still be bound by them and might be much less valuable to him.

To give protection to purchasers, a system of registration of land charges has been introduced which takes the place of the doctrine of constructive notice. A purchaser takes the land freed from any registrable charge if the charge is not entered in the register. Earlier statutes were consolidated and extended by the Land Charges Act, 1925, which was made necessary by the changes arising from the Law of Property Act, 1925.

Five separate registers are kept under the names of the persons owning the land. They note respectively pending actions, annuities, writs and orders affecting land, deeds of arrangement, and (a general heading) land charges. This last heading includes puisne mortgages (i.e. all legal mortgages except those in which the mortgagee has the title deeds deposited with him); limited owners' charges (e.g. charges in favour of a tenant for life who has paid debts due in respect of the land); estate contracts (e.g. contracts for the sale of the land); general equitable charges (e.g. a lien for unpaid purchase money); charges for death duties; equitable easements; and restrictive covenants. The registers are kept at the offices of the Land Registry in Lincoln's Inn Fields.

Land Court. Judicial body appointed to administer new and exceptional laws relating to the land. It is needed primarily in districts where poverty and discontent with the existing system prevail. For Scotland one was set up by the Small Landholders Act, 1911. Really it is the abolished Crofters' Commission in an enlarged form, doing for the whole country what that body did only for the crofting districts. It fixes fair rents where necessary, and decides questions of price, when land is acquired compulsorily for small holdings, etc.

Land Crab
(*Gecarcinus*). Crab,
of several species.



Land Crab. Specimen of *Gecarcinus ruricola*, from St. Kitts, West Indies

whose breathing apparatus is so modified as to enable it to live on land. Land crabs are common in tropical regions and usually live near the sea, burrowing under stones and in the sand. At the breeding season in the spring they make their way in companies to the sea, where the eggs are laid. Their food consists mainly of vegetable matter and offal, and they often inflict great damage in sugar plantations. There are a number of species, the black crabs or mountain crabs of the W. Indies, the land crabs of Ceylon and India, and the white crabs of Jamaica being the best known.

Landen. Town of Belgium. In the prov. of Liège, it is a rly. junction, 23 m. N.E. of Gembloix. Landen is noted for the battle fought July 19, 1693, between an allied army under William III of Great Britain and the French, also called the battle of Neerwinden.

William's army was encamped around Landen and Neerwinden when Luxembourg, in command of the French, decided to attack. By feigning an attempt on Liège, he induced William to weaken his force by about 20,000 men. This done, Luxembourg's main attack was made on Neerwinden, subsidiary ones being directed towards the allied left at Landen. The first assault on the pivotal position was repulsed, as was the second, William being in the thick of the fight when the French were driven back. The third assault succeeded, and an attack by French cavalry gave the victory its finishing touch. Some British troops offered a stout resistance as they fell slowly back, but elsewhere the allies were routed. They lost 12,000 out of 50,000 engaged, and many guns and standards. The French lost 8,000 out of 80,000. Macaulay in his History gives a vivid account of this battle.

Landen, JOHN (1719-90). An English mathematician. Born at Peterborough, Jan. 23, 1719, he achieved reputation as a mathematician through his essays in the Lady's Diary for 1744. From researches on elliptic functions he evolved Landen's point and Landen's transformations. In 1775 he laid down the theorem for the expression of the arc of an hyperbola in terms of two elliptic arcs; for this he was

elected F.R.S. He showed that the roots of a cubic equation may be derived by the infinitesimal calculus. Died Jan. 15, 1790.

Lander, RICHARD LEMON (1804-34). A British explorer. Born at Truro, Feb. 8, 1804, the son of an innkeeper, in 1823 he went to Cape Colony as a servant to a Major Colebrooke, with whom he crossed the colony. Entering the service of



Richard Lander,
British explorer

Hugh Clapperton (q.v.) in 1824, he went with him to West Africa, and on Clapperton's death in 1827, published an account of the expedition. In 1830 he was sent by the government to explore the Niger, which he ascended as far as Yaorie. Lander was given the Geographical Society's gold medal. Two years later he was sent to open up trade in Central Africa, but was wounded in a fray with the natives and died at Fernando Po early in Feb.; 1834.

Landernau. Town of France, in the dept. of Finistère. It lies 9 m. by rly. N.E. of Brest, at the head of the narrow estuary of the Elorn, and is the rly. junction of the Brest-Nantes line. There is a 16th century church of S. Thomas of Canterbury. Pop. 10,975.

Landes. A department, the second biggest, of France. Its W. edge is the straight sandy coast of the Bay of Biscay, and it is contiguous with the depts. of Gironde, Lot-et-Garonne, Gers, and Basses-Pyrénées. The Adour, Midouze, Luy, and upper Leyre are the chief rivers. S. of the Adour, the country, known as La Chalosse, is hilly and cultivated; sheep and horses are bred. N. of the river begins the tract of sandy and marshy flats, extremely infertile, known as the *landes*. The capital of the dept. is Mont-de-Marsan, other towns of note being Dax, St. Sever, and Aire, seat of a bishopric; Morceaux is a rly. junction, and there are a few small watering-places on the coast, which has extensive lagoons and lofty sand dunes. Area, 3,604 sq. m.: pop. 248,395.

The *landes* form a remarkable physical feature of S.W. France. Including the parts falling within the depts. of Gironde and Lot-et-Garonne, they cover in all an area of some 5,000 sq. m. Much of this is covered with furze and heath, but parts have been brought under

cultivation. Pine forests have been planted, which have helped to arrest the sand drift, and resin is collected. In the 1949 summer drought, fire devastated 339,000 acres and 69 million cu. ft. of planted timber, destroyed 443 buildings, and caused £5,000,000 damage; 84 were killed Aug. 21, and 269 families rendered homeless.

Landgrave. A German title meaning originally count of the land or country district, as opposed to burgrave or lord of the burg or town. The title was borne by certain rulers of small principalities, e.g. the landgrave of Thuringia. Before 1918 it was borne by certain non-ruling princes of Hesse. *See* Count.

Landing Craft. Power-driven vessel designed for the landing of troops, armour, artillery, and supplies on a hostile coast where port facilities are not available. Until the Second Great War no specific vessels were employed in military amphibious operations; men and materials were put ashore from ships' boats run up on the beach. Experiments at Gallipoli in 1915 convinced the British Admiralty that any large-scale troop landing and subsequent maintenance, where an up-to-date harbour was lacking, demanded a specialised type of armoured craft which was sufficiently seaworthy to operate in adverse weather, also able to discharge troops and vehicles from the bows (since a vessel approaching a beach head-on presents the minimum target).

In 1935 the first landing craft, LCA (Landing Craft, Assault), was designed and developed at Portsmouth. The vessels were 40 ft. long, drew only 3 ins. of water, were powered by two separate motors each driving one screw, were armed and armoured against air attack, and could accommodate 36 fully equipped infantrymen besides naval personnel. They were not intended to make lengthy passage under their own power, but were slung on davits in ocean-going ships and launched for the final assault. They helped to lift troops from Dunkirk, May, 1940, but were first put to their intended purpose in raids which were carried out on the occupied Norwegian islands in 1941.

The LCI (Landing Craft, Infantry) was a large version of the assault craft. It displaced 250 tons on a length of 157 ft. and was propelled by twin Diesel engines developing 1,800 h.p. It was a sea-going vessel independent of a parent ship. A later variant, the

LCS (Landing Craft, Support) had rocket guns and smoke-screen generators.

For vehicles and armour, the LCM (Landing Craft, Mechanised) was built. It displaced 20 tons on a length of 56 ft. and had a speed of 12 knots. From this was developed the LCT (Tank) of 125–200 tons, 112–140 ft. long, propelled by triple Diesel engines. This had a mechanically-operated ramp and doors in the bows, through which vehicles could be driven straight on to the beach. Other small types were LCVF (Vehicles and Personnel), LCG (Gunboat), and LCF (Flak), which was used as an A.A. escort to landing craft in narrow waters.

The Allied landings in N. Africa, Italy, and the Pacific called for larger craft, including the LST (Landing Ship, Tank), which displaced 1,600 tons on a length of 330 ft., and had hinged bows and a ramp for disembarkation of vehicles. During the campaigns in Europe of 1944 to 1945 some LSTs were converted into train ferries with tracks on the decks.

In preparation for projected landings on the Japanese mainland, the Admiralty built LSDs (Landing Ships, Dock). These displaced 4,500 tons on a length of 458 ft., their geared turbines developing 7,100 h.p. Much of the hull could be laid open to the sea through an orifice in the stern, so that the craft was partly ship and partly floating dock. It carried infantry and tank landing craft in the hull and these were floated out for the assault. It was also used as a floating dock for the repair of landing craft at sea.

During the war some 6,000 landing craft and ships were built for the Royal Navy, of which 1,308 were lost in operations. Numbers of similar craft were built and manned by the U.S. navy, while a few served the Germans in the operations against the Dodecanese. *See* Amphibious Craft; Armoured Vehicles; Boat, *illus.* p. 1244; Strategy.

Land League. An organization formed in Ireland in 1879. The avowed objects of its promoters, as set forth at their first meeting in Dublin on Oct. 26, were to secure the reduction of rent and the ownership of land by the peasantry. It was also proposed to raise money for assisting the peasants and to help them with legal advice. The declared methods by which these ends were to be obtained were legitimate, but when the league got to work much

of its action was indefensible. The period of its greatest activity, 1879–81, was one of great unrest in rural Ireland, shooting, maiming, and other outrages being frequent. Tenants refused to pay their rents, and violent measures were taken to stop evictions for non-payment, while terrorism in the shape of moonlighting and boycotting was rife. Michael Davitt was the real founder of the league, while Parnell as president was openly associated with it. Declared illegal in 1881, it gradually died out. *See* Ireland: History.

Land Line. Term used in radio engineering to describe that part of a radio-telephonic or radio-telegraphic communication channel which is not part of the radio link. Such lines link up broadcasting studios and transmitters, also broadcasting systems in different countries not separated by too great a stretch of water; it has been proved that land line connexion between such stations is more reliable and free from interference than any other methods. Outside broadcasting is greatly dependent upon land lines laid from the scene of the broadcast to the transmitting station. The same principle is used for simultaneous broadcasting on widely separated transmitters. *See* Radio.

Landlord. General term for one who owns land or houses. It is also used for the keeper of an inn. The fact that absolute ownership of land has never existed in England accounts for the use of the word in preference to landowner. The one who hires the land or house from the landlord is known as the tenant, and the relations between the two are regulated by the common law and a number of statutes.

The relation between them is created by a contract called a demise, whereby the landlord agrees to let and the tenant agrees to take the premises, either for a certain term or for an indeterminate period, determinable on notice, at a rent in money. If a person goes into possession of another's premises and pays him rent referable to a year or any part of a year, e.g. a quarter, half-quarter, or half-year, he becomes a tenant from year to year. Such a tenant must give, and is entitled to, half a year's notice to quit, terminating at the end of a current year of the tenancy. If a tenant under a lease or written agreement remains in possession after the lease, etc., has expired, and pays rent, he is a tenant from year to year upon the

terms of the lease, *e.g.* as to repairs. Weekly, monthly, and other tenants, not from year to year, must give, and are entitled to, a reasonable notice to quit, generally a week, a month, or other period.

The liability of the landlord and tenant to do repairs is a matter of agreement. With tenements let at not more than £40 in London or £26 in the rest of England, the landlord impliedly warrants that the house is fit for habitation, and undertakes to keep it so. In letting a furnished house, also, there is an implied condition that the house is reasonably fit for human habitation. In all other cases, unless by express agreement, the landlord is not liable for any repairs, and the tenant must go on paying rent even if the house is burnt down.

Right of Distress

Landlords have one exceptional privilege—the right of distress for rent. This means that a landlord whose rent is in arrear may go, or send a certified bailiff, on to the premises and seize, and ultimately sell, enough of such goods as he finds there as will pay his rent. Formerly it did not matter whose goods they were; but by the Law of Distress Amendment Act, 1908, the goods of an under-tenant, lodger, or person, not being a tenant or having any beneficial interest in the premises, are protected from distress by a superior landlord upon certain terms, *e.g.* that the landlord may require the under-tenant to pay any back rent or future rent to him direct. Since the First Great War it has not been possible to exercise this right of distress without the leave of the court in the case of houses within the Rent Restriction Acts; and legislation introduced during the Second Great War, which required the landlord in all cases to obtain the consent of the court, has been retained.

Tenants of agricultural holdings and market gardens stand on a different footing from others. They have security of tenure, *i.e.* if such a tenant is "unreasonably disturbed" he has a right to compensation. He has a right to compensation on removal for improvements made by him, subject to some limitations. He is always entitled to a full year's notice under a yearly tenancy. He can claim compensation for damages by game. He has a larger right to move fixtures and fixed machinery than an ordinary tenant. He is given freedom of cropping and disposal of his produce,

notwithstanding any contract restricting him; and in many other ways the power of the landlord is restricted. See *Agricultural Holdings Acts*; *Distraint*; *Rent Restriction*; *Rent Tribunal*. *Consult Laws of Landlord and Tenant*, W. Woodfall, 19th ed. 1912; *Relationship of Landlord and Tenant*, E. Foa, 5th ed. 1914.

Landlord and Tenant Act.

Enactment of 1927 which made important amendments in the law. Before this Act, a tenant of business premises such as a shop would at the end of his tenancy receive no compensation for the goodwill which had been built up by him, the landlord getting the benefit. But now the tenant is, subject to certain conditions, entitled to compensation for the goodwill attaching to the premises, or in some cases to a new lease of the latter. The main conditions are that: (1) the tenant has carried on business at the premises for at least 5 years; (2) by reason of his so carrying on business, goodwill has become attached to the premises so that they can now be let at a higher rent; (3) the claim is made in the manner prescribed by the Act. But no compensation is payable for goodwill that is personal to the tenant and does not attach to the premises.

The Act further gave a tenant of business premises a right to compensation for improvements made during his tenancy which add to the letting value of the premises; limited the damages recoverable by a landlord for breach of a covenant to keep premises in repair; and extended the right of a tenant to assign or sublet.

Land Mine. The container of explosive used in warfare to halt the advance of infantry and armour. The name was erroneously applied to the parachute bomb dropped from aircraft in the Second Great War. See *Mine*.

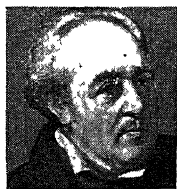
Landnamabok. An early Icelandic chronicle. It gives the names of 1,400 places and 3,000 persons in the island, with many old traditions and a detailed account of how the land was taken possession of by the first settlers. The work was originally compiled by Ari and Kolsegg (12th cent.), and added to by three later writers in the 13th and 14th cent. It was published at Copenhagen in 1900 *Consult Origines Islandicae*, G. Vigfusson and F. Y. Powell, 1905.

Land of Hope and Glory. British patriotic song, the words of which are by A. C. Benson,

the music by Elgar. It was the official ode written and composed for a Covent Garden gala performance in honour of King Edward VII's coronation, 1902. As this performance never materialised because of the postponement of the coronation, the song was first heard at the Sheffield festival the same October. The refrain was adapted from the trio in the composer's *Pomp and Circumstance March*, No. 1, composed 1901. Clara Butt helped greatly in so popularising the song in the next few years that it became almost a second national anthem. During the First Great War, Benson produced a modified version of the words, avoiding the phrase "Wider yet and wider shall thy bounds be set." But this new version was never generally accepted.

Landor, ARTHUR HENRY SAVAGE (1865–1924). British explorer. The grandson of Walter Savage Landor, he was born in Florence, and educated there and in Paris. In 1897 he explored both sources of the Brahmaputra, and was the first white man to explore central Mindanao Island, where he discovered the Mansakas tribe. In 1890 he went with Allied troops to Peking (Peiping), and was one of the first to enter the forbidden city of Lhasa. Between 1900 and 1914 he travelled in the East, in Africa—8,500 m. in a year—and in S. America. During the First Great War he served on the western front. His books include *In the Forbidden Land*, 1898; *Tibet and Nepal*, 1905; *Across Unknown S. America*, 1913; *Memoirs of an Explorer*, 1924. He died Dec. 26, 1924.

Landor, WALTER SAVAGE (1775–1864). A British author. Born at Warwick, Jan. 30, 1775, son of a wealthy doctor, he lived early at Ipsley Court and Tachbrook, estates of his mother. He was educated at Knowle, Rugby, and Trinity College, Oxford, where his temper got him into trouble with the authorities, but where he displayed high qualities as a classical scholar. Estranged from his family, he spent some time in Wales, where he met the Ionë and Ianthe of his early verse, and Rose Aylmer, whose untimely death at



After W. Fisher

Calcutta, 1800, inspired an exquisite elegy. A book lent by Rose suggested his poem Gebir, 1798, dealing with the legendary prince who gave his name to Gibraltar.

Landor visited Paris in 1802, and after his father's death in 1805 settled at Bath. He raised and accompanied a force to fight for Spanish independence in the Peninsular War, and on his return to England bought the estate of Llanthony Abbey, but had to hand over the management to his mother. In 1811 he married in haste, and with unhappy results, Julia Thuyllier, the daughter of a Banbury banker. That year appeared Count Julian, a tragedy. In 1814 he went to Jersey and thence to France, and in 1815-18 was at Como, which he had to leave for writing a Latin lampoon on the authorities. He lived at Pisa, 1818-21, and at Florence, during 1821-25. His *Imaginary Conversations* (*q.v.*) appeared, in 5 vols., 1824-29. In 1829 Landor bought the Villa Gherardesca, near Fiesole, where the happiest part of his life was marred only by litigation with a neighbour. He visited England in 1832, and brought out his *Citation and Examination of William Shakespeare*, 1834. He left Italy in 1835; published *The Pentameron*, 1837; settled again at Bath, 1838-58; and published his collected works, 1846. In 1858 he returned to Florence, where he died Sept. 17, 1864, being buried in the Protestant cemetery.

Landor's Character and Work

While Landor's volcanic temperament—Carlyle called him “the unsubduable old Roman”—and Dickens depicted his tantrums with fidelity in the character of Lawrence Boythorn in *Bleak House*—involved him in endless quarrels, he had many devoted friends. His republicanism, which led him to idolise Washington in youth and Garibaldi in old age, was directed against tyranny; he was essentially an aristocrat. Despotism, yet tender where his heart was touched, he was a lover of the dumb creation. A classical enthusiast, he failed at sustained effort. He wrote some of the most beautiful lyrics in the English language; but is at his best in the prose of the *Imaginary Conversations* and *Pericles and Aspasia*. Authoritative criticism suggests that, in his anxiety to avoid the superfluous, he sometimes omits to say what is necessary, a comment that em-

phasises the contrast between the man and the artist. While he lived his public was small, but as he himself said: “I shall dine late; but the dining-room will be well lighted; the guests few and select.”

Bibliography. Life and Works, ed. J. Forster, new ed. 1895; Landor, S. Colvin, 1881; *Collected Poems*, ed. C. G. Crump, 1892; *Letters*, ed. S. Wheeler, 1897-99; *Last Days, Letters and Conversations*, ed. H. C. Minchin, 1934; *Shorter Poems*, ed. J. B. Sidgwick, 1946.

Landrail. Alternative name for the cornrake (*q.v.*), in contradistinction to an allied species of aquatic habit, which is known as the water-rail.

Landrecies. Town of France, in the dept. of Nord. Situated on the canalised Sambre, near the S. part of the Mormal forest, it is 11 m. W. of Avesnes, and 50 m. S.E. of Lille. An old fortress town of about 4,000 inhabitants, it was prominent in the wars of the 17th-18th cents. It has tanneries and its manufactures include textiles. It appears in Stevenson's *An Inland Voyage*.

Landrecies was the scene of a sharp engagement between British and German forces early in the First Great War. At dusk on Aug. 25, 1914, during the retreat from Mons, the 4th Guards brigade who had just reached their billets here were heavily attacked by an advance body of the 9th German corps. Fighting took place in the streets of the little town and machine-guns were brought into play. The British, reinforced, drove the Germans from the town after a six hours' battle; but the Germans occupied it following the general British retreat to the Marne, and it remained in their possession until the war ended.

Land Registration. Method by which the title to land is registered by a public department. Its object is to introduce a complete and less expensive method of transferring land, which, when the system is thoroughly rooted, can be transferred by a simple entry in the register, as are stocks and shares. For England and Wales, the Land Transfer Act of 1897 made a beginning in this direction. The business is now governed by the Land Registration Act, 1925. All estates and interests in land which are “legal estates” may be registered and in certain areas—*e.g.* London and Middlesex—must be. An area may be made a compulsory registration area by Order in Council, though registration need not take place until there is a

sale of the land. When the land is registered the proprietor receives a certificate.

In certain provinces of Canada (Saskatchewan, Alberta, and North-West Territories), in Papua (Australian Territory), the Federated Malay States, Sudan, and Uganda, land is conveyed, not by deed, but by registration of title in the official registry. In 16 territories of, or belonging to, the U.S.A. the same kind of system is employed. But in the rest of the English-speaking world, except the U.K., the conveyance of land is by deed, which deed must be registered. It may be said that registration alone is only adopted where the bulk of the land is not in private ownership; so that when land is granted to a settler he can be placed on the register with little trouble or expense.

In some places (New South Wales, Ceylon, and certain U.S.A. states) the register is conclusive. The registered owner is the only owner. But in most others a person may acquire possessory rights, even as against the registered owner, *e.g.* Victoria, W. Australia, Fiji, and the Sudan. In S. Australia, New Zealand, Manitoba, British Columbia, and Saskatchewan, the registered title is good only as against subsequent claimants; but can be disputed by a person who was already in possession at the time of registration. In the U.S.A., where registration prevails, the only operative act to transfer any interest in the land, *e.g.* a mortgage or charge on it, is the act of registration. But in the British system as a whole certain interests in the land may be transferred by deed, although registration is compulsory for ownership. Sometimes the state warrants the title if it is placed on the register, so that any one dealing with the registered owner is quite safe.

Landru, HENRI DESIRÉ (ex. 1922). French criminal. He became known during his trial as the “modern Bluebeard,” being found guilty of 11 murders, all but one of women who accepted his offers of marriage and wealth. In six years



H. D. Landru,
French murderer

(1913-19) of criminal activity, it was estimated from police records that Landru attracted and deceived 283 women. The case against him involved two years of

ceaseless investigation, but he was finally sent to the guillotine on Feb. 23, 1922.

Landsberg. German name of several European towns. The most important town of Landsberg (Pol. Gorzów Wlkp.) is on the Warthe, 40 m. N.E. of Frankfort-on-Oder, in the part of Germany placed under Polish administration in 1945. A railway and inland shipping centre with, before the Second Great War, important textile, shoe, brick, and engineering industries, it had a pop. of 45,928. It was founded in 1257, and frequently became the scene of battles.

Landsberg, on the Lech, in Bavaria, Germany, 22 m. S. of Augsburg, possesses a wealth of old buildings, among them six churches of the 14th to 18th centuries, a famous Renaissance town hall, and gate towers, including a new one built by Hubert von Herkomer in memory of his mother. It makes ploughs and paper. Pop 13,000.

A castle near Meiningen, in Thuringia, of this name was built 1836-40 as a residence of the dukes of Saxe-Meiningen, on the site of a medieval castle situated on a rocky hill 1,260 ft. high.

Landscape. In art, a picture representing inland scenery as opposed to seascape. The term is sometimes used of the scenery itself, and the word was once written *landskip*. Origins of the art of landscape painting, which as such is relatively modern, are seen in the delicate scenic backgrounds of many Renaissance subject-pictures, e.g. in those of the Umbrian and Florentine schools, developed more boldly by Venetian painters of the style of Giorgione. The practice of making the scenery itself the essence of the picture rather than an incidental background, i.e. of turning the "figures with landscape" into a "landscape with figures" or even without figures, began in the 17th century, and is more generally associated with the Northern schools. Rubens was one of the earliest to revel in vast landscape canvases. Such Dutch painters as Seghers and Ruisdael expressed their love of scenic beauty and their sense of the peculiar emotions aroused by the dispositions of inanimate wild nature, especially in its more dramatic and tempestuous aspects; while Hobbema and others (including Rembrandt) delighted in the more homely aspects of scenery, i.e. in nature as subdued by the hand of man, as seen in farmsteads, country roads, and other evidences of human

rural activity. In the 18th century Gainsborough found similar inspiration in English rural scenery; but Richard Wilson, with his poetic "classical" landscapes, stands at the head of another school which followed a formula that was dependent mainly on aesthetic conventions rather than on a direct representation of natural forms. His exquisite pictures may be called idealised landscapes.

The English Tradition

Towards the end of the 18th century there was also a fashion for somewhat pedestrian topographical landscapes, faithful if uninspired representations of the facts of particular "beauty spots." It was from these topographical artists that the great English school of landscape painters in water colours was directly descended, including such men as Girtin, Sandby, Cozens, and Cotman—all of whom in differing ways tended to fuse topography with the conventions of "classic" landscape design, the last-named contributing a unique emphasis on landscape pattern. Others, such as David Cox and De Wint, rendered particular aspects of nature more directly and freely in terms of water-colour, as Constable was seeking to do in the older medium. Constable chose as his guiding principle the utmost fidelity to objective nature; his work had a profound influence on the French landscape painters of the Barbizon school, e.g. Rousseau, and later Corot. Meanwhile, that great genius Turner, after consummate work which blended the topographical, classical, and emotional, had achieved the seemingly impossible by triumphantly portraying not so much the natural facts of a scene as the fleeting intangibility of the sunlight or atmosphere in which it was steeped.

Constable and Turner, and later the French impressionists, established it as a function of landscape to reveal a particular "mood" of nature, irrespective of the accidents of topography. Thus many landscapes might more accurately be called *skyscapes*, *sunscapes*, *cloudscapes*, or even *fogscapes*. Moreover, as the artist can discern nature's moods anywhere, landscape no longer needed to confine itself to rural or near-rural subjects; urban and industrial scenes came into the net of the landscape painter, and one may sometimes hear of *streetscapes* or *townscapes*. In this broadest sense, as well as in the traditional sense, landscape

remains an unending inspiration to countless artists, though the treatment, like the selection of subject, will vary with each individual and every change in fashion. It may, for example, find expression in the structural formalism of Paul Nash and Vivian Pitchforth or in the decorative realism of James Bate-man and David Bone. Even the vagaries of the Surrealists have sometimes led them to express their released inhibitions in the form of landscapes that are no less deserving of the name because they are only the landscapes of a dream. See *Painting*.

Gordon Stowell, A.R.C.A.

Land Clauses Acts. Statutes passed by the British parliament in 1845, 1860, 1869, 1883, and 1895. They deal with compulsory purchase of land by various public bodies like railway companies, who are empowered by private Acts of Parliament to make such compulsory purchases. The procedure prescribed is, shortly, that the purchasers serve a "notice to treat," which, in effect, states that they desire to take so much land. The vendor may then either come to an agreement as to price, or have it assessed by one of several tribunals.

Landseer, SIR EDWIN HENRY (1802-73). British animal painter. Born in Queen Anne Street East, London, March 7, 1802, son of John Landseer, the engraver, he studied under his father, and in 1816 entered the R.A. schools. His first pictures appeared at the R.A. in 1815. In 1822 his *Larder Invaded* gained him a premium of £150 from the British Institution. He was elected A.R.A. in 1826 and



Landseer

Self-portrait

R.A. in 1831. The gold medal was awarded him at the Paris Exhibition of 1855, and in 1865, on the death of Eastlake, he was offered the presidency of the R.A., which he declined. A knight from 1850, he died at St. John's Wood, Oct. 1, 1873, his last years having been clouded by fits of depression.

Among Landseer's works one may cite specially *The Highland Shepherd's Chief Mourner*, 1837; *Dignity and Impudence*, 1839; *A Random Shot*, 1848; *The Monarch of the Glen*, 1851; *The Swannery Invaded by Sea Eagles*, 1869; and the sculptured lions of Trafalgar Square. This most popular artist of his time is well represented at the National Gallery, while a collection of his etchings and engravings is in the British Museum. See Engraving; consult Lives, F. G. Stephens, 1880; J. A. Manson, 1902.

Land's End. The most westerly point of the island of Great Britain. It is in Cornwall, 9 m. S.W. of Penzance. The cliffs, of granite formation, are 60 ft. in height. To the W. are the Longships (*q.v.*), a dangerous cluster of rocks with a lighthouse. From Land's End to



Sir Edwin Landseer. *Dignity and Impudence*, one of the artist's best known studies of dogs
National Gallery, London

from the state; in others they were provided with a cottage and a plot of land for poultry-keeping or fruit-growing, and made a living by seasonal work in neighbouring towns or on the land.

By April, 1919, the board had acquired 12,267 acres and county councils some 90,000 acres; there were in England and Wales seven government colonies of small holdings ready for working at Patrington, Pembrey, Heath Hill, Rolleston, Holbeach, Amesbury, and Bosbury. At Holbeach the settler paid a rent of 50s. per acre per year, while the rent for a cottage was £10 and for buildings £5 a year. A Land Settlement

provided for agriculture, fruit-growing, and stock-raising. Advances by way of loans on easy terms were made by the government.

A defect of the land settlement scheme was the attempt to make farmers out of untrained settlers too quickly. In England many ex-servicemen farmers went bankrupt, and in the dominions a proportion of the settlers sold their holdings to seek work in the towns. For this reason no similar scheme was put into operation after the Second Great War. The dominions confined their plans to their own countrymen, and in England the emphasis was placed on training. Emigrants to the dominions were advised, if they wished to take up farming, to obtain work and study local conditions for two years before considering the purchase of a holding of their own.

Landshut. German town and rly. junction on the river Isar, 40 m. N.E. of Munich. Between 1255 and 1503 it was the residence of the dukes of Bavaria, and in modern times the educational centre of Lower Bavaria. The old town developed around a strong castle of the same name (meaning guard of the country), later called Trausnitz, which still survives. From 1279 possessing urban rights, Landshut contains gabled houses of the 15th century, a fine old Rathaus, a Renaissance palace (1536), and many churches, including that of S. Martin with its 450-ft. tower, and the rebuilt Dominican church (originally built 1271-1306). A monastery holds in its crypt the tombs of 45 members of the Wittelsbach dynasty. During 1800-26 there was a university. Landshut is concerned with foodstuffs and the iron industry. Pop. 30,858.

Landskrona. Seaport of Sweden, in the län of Malmöhus. It stands on The Sound, 31 m. by rly. N. of Malmö, and 16 m. N.N.E. of Copenhagen. It has an old castle, completed in 1543 and now utilised as a prison, shipbuilding yards, iron-foundries, sugar refineries, besides manufactures of leather, tobacco, and gunpowder. The exports include corn, butter, eggs, and cattle. It was fortified until 1870. Here Charles XI defeated the Danes, July 14, 1677. On the neighbouring island of Hven, Tycho Brahe built his observatory of Oranienborg. Pop. 23,015.

Landslip. Fall of a considerable amount of earth or rocks from a higher to a lower level. Along coastlines, landslips are caused by



Land's End, Cornwall. The rocky cliffs at the western extremity of Great Britain
Frith

John o' Groats is regarded as the extreme length of Great Britain.

Land Settlement. Organized settlement of men on the land as farmers or smallholders. The term covers all colonisation schemes, but in particular refers to plans for establishing ex-servicemen in agriculture. Widespread schemes of this kind were started during the First Great War. In 1916 a Small Holdings (Colonies) Act was passed in the U.K., and the board of Agriculture purchased estates and gave holdings to ex-soldiers and sailors who wished to take up farming. In 1917 a British Empire land settlement propaganda league was formed. Conditions varied in different localities: in some the settlers obtained holdings by paying or borrowing

(Facilities) Act was passed in 1919, and under it soon 12,658 civilians and ex-service men were settled on 179,064 acres. In Scotland the system of land tenure followed the principle of the Small Landholders (Scotland) Act.

Meanwhile the governments of all the dominions except S. Africa were elaborating schemes for the settlement of soldiers. Canada offered 160 acres to each man, with a loan of £300-£400 repayable over fifteen years; preference was given to Canadians, but when their wants were supplied British applicants became eligible. A similar policy was adopted in Australia. New Zealand was first in the field, for by Aug., 1915, the first men were on their sections dairy-farming. Areas were pro-

the undercutting action of the waves, and are especially encountered where the strata dip gently towards the sea. In inland places landslips are liable to occur where the strata dip steeply towards a river valley. Heavy rains, melting snows, or the action of frost are also factors in producing falls or avalanches of enormous quantities of rock from steep mountain sides to the valley below. Many landslips have been recorded in connexion with earthquakes. Valley landslips frequently produce a lake by damming the river flowing through the valley. See *Rock*.

Landsteiner, KARL (1868-1943). Austro-American pathologist. He was born June 14, 1868, in Vienna, graduated in 1891 in medicine, and taught at Vienna university, 1909-19, subsequently at various American universities. He made a reputation by research work on infantile paralysis and on such blood diseases as haemoglobinuria. Having discovered, shortly before the First Great War, the human blood groups, he was able to lay down principles of vital importance for blood transfusions. For this discovery Landsteiner, who was at the Rockefeller Institute for medical research from 1922 to 1939, received the Nobel prize for medicine in 1930 and many other awards and honours. He died June 26, 1943.

Landsturm. A German term signifying the general enlistment of all men capable of bearing arms and not already members of one of the fighting services. In those countries where troops are conscripted, the term is sometimes used to designate third-line troops. In the German army up to 1918, all soldiers were drafted into the first ban of the Landsturm on completion of their service with the first line, reserve, and Landwehr (*q.v.*). The second ban consisted of untrained troops between the ages of 39 and 45. The corresponding units in the Second Great War were called Landesschützen (local defence) units; formed on general mobilisation, they consisted mainly of men over 40, and were at first organized only in battalions, later being grouped into regiments and divisions. See *Volkssturm*.

Landtag. German name for an assembly, something like the English parliament of early days. It means the day of the land, i.e. the day on which the estates of the land met, and is thus allied to the

word diet. Most German states had their *Landtags*, bodies of nobles and prelates arising in the 14th and 15th centuries, to advise the ruler and provide him with money. Gradually they secured more power and their constitution became more settled, although they were not composed of elected representatives in the modern sense until after the Napoleonic upheaval. See *Diet*; *Estates*.

Land Tax. Any tax levied on land. One existed in Greece and in the Roman Empire. In England the Danegeld was a land tax. Under the feudal system the payments made, whether in armed men or in money, were in reality land taxes, as were those other feudal incidents abolished in England in 1660. Land taxes have been imposed in France, Italy, China, Egypt, and other countries. In the 19th and 20th centuries the policy was often to tax land that had not been improved or developed, the idea being not so much to raise money as to force it into use. This explains the taxes on unimproved land levied in New Zealand, South Australia, and other parts of the British Empire, and one raised in Great Britain between 1910 and 1920. Another form of land taxation urged is one on site values. Tithes are a form of land tax.

Apart from these there is a land tax in Great Britain. This was first imposed in 1692, being a property tax of 4s. in the £. It was, however, in practice confined to land, and the rate varied from time to time between 1s. and 4s. in the £. In 1798 Pitt allowed landowners to redeem it by a single payment, and many did so. The result was that the amount payable each year was reduced to less than £1,000,000. The tax was raised by fixing a total sum to be paid and apportioning it between the various parishes of the country. See *Taxation*; *Tithes*.

Land Value. The value of land arises from the use to which it can profitably be put—e.g. agriculture, market-gardening, house-building, industrial or commercial building. The value varies with the profitability of the use; hence, e.g., higher prices of agricultural produce tend to increase the value of agricultural land. The value of any piece of land is the present estimate of the future rents (that is, special advantage accruing from its use), plus an estimate of the possibility of an increased rent if the land is used for some more profitable purpose. The possibility of an additional value

through a more profitable use is called the development right in the land. Thus, agricultural land may be valued and bought primarily because of its building development rights.

Since land values depend partly on the suitability of the land for certain social purposes and partly on prices, that is, on the demand for the produce of the land, they are largely a result of the activity of the community. The more prosperous, enterprising, and expansive a community, the greater the increase in land values in its vicinity. For this reason increases in land values that result merely from changes in social demand, and not from improvements made by the landowners, are a form of unearned increment. Many people, notably Henry George and his followers, have advocated that such unearned increment, created by the community, should accrue to the community. Lloyd George, in the 1909 budget, imposed an increment value duty, abolished in 1920 principally because of administrative difficulties.

The development of town and country planning during the 20th cent. emphasised the need to grapple with the social implications of increased and decreased land values. A commission on compensation and betterment presided over by Mr. Justice Uthwatt was appointed in 1941 to consider the problem. Its report, 1942, provided the framework for the Town and Country Planning Act, 1947, which vested land development rights in the state and set up a central land board empowered to levy a development charge whenever the owner of land changes the nature of its use in such a way as to increase the rent or annual value. See *George, Henry*; *Town Planning*; *Single Tax*.

Landwehr. German term signifying defence of the country. In conscripted armies it is frequently applied to the second-line troops. The Prussian Landwehr was formed by a royal edict of 1813, calling up for defence of the country all men between the ages of 18 and 45 capable of bearing arms. It became an integral part of the Prussian army after the peace of 1815, but in 1859 was relegated to the second line.

In the German army up to the First Great War, every soldier on completion of his first-line and reserve service was drafted into the Landwehr, and remained a member until at 39 he was transferred

to the Landsturm (*q.v.*). He was required to carry out short periods of training. Revived under the Nazi regime, Landwehr troops were trained in peace for eight or sixteen weeks according to their category. The Landwehr divisions were at first employed only for home duties, but later had to be used in fighting; their equipment was in general inferior to that of regular divisions.

Lane, EDWARD WILLIAM (1801-76). British Arabic scholar. Born at Hereford, Sept. 17, 1801, owing



Edward W. Lane,
British scholar

to ill health he went to Egypt, where he acquired a thorough knowledge of the country and people, embodied in an *Account of the Manners and Customs of the Modern Egyptians*, 1836. His translation of the *Thousand and One Nights*, 1838-40, though the most accurate, is somewhat unattractive in style, but the notes contain a fund of information. He died Aug. 10, 1876. His vast Arabic Lexicon, 1863-92, was finished by his great-nephew, Stanley Lane-Poole (*q.v.*), who also produced a *Life*, 1877.

Lane, SIR (WILLIAM) ARBUTHNOT (1856-1943). British surgeon. Born at Fort George, Inverness-shire, July 4, 1856, and trained at Guy's Hospital, he became a distinguished surgeon, specialising in the treatment of fracture. He was also noted for his operation for cleft palate, and was a pioneer of plastic surgery. Made a baronet in 1913, and C.B. in 1917, in later life he became a leading controversialist on matters affecting the public health. *New Health for Everyman* appeared in 1932. He died Jan. 16, 1943. *Consult Life and Work*, W. E. Tanner, 1946.

Laneham, ROBERT (*fl.* 1575). A London mercer. Educated at St. Paul's School, he travelled in France and Flanders, and became a protégé of Robert Dudley, earl of Leicester. As doorkeeper of the council chamber, he witnessed the entertainment given by Leicester to Elizabeth at Kenilworth in 1575, his description of which was published anonymously in the same year. *Consult Robert Laneham's Letter*, ed. F. J. Furnivall, 1907.

Lane-Poole, STANLEY (1854-1931). A British scholar. Born in London, Dec. 18, 1854, and educated at Corpus College,

Oxford, he joined the staff of the British Museum in 1874. He prepared catalogues of Oriental and Indian coins, 1875-92, and between 1876 and 1893 completed an Arabic lexicon started by his great-uncle E. W. Lane. A visit to Egypt in 1883 on behalf of the museum resulted in two books on Egyptian life, 1883, and *Art of the Saracens*, 1886. Lane-Poole was professor of Arabic at Trinity College, Dublin, 1898-1904. His biographies include Lord Stratford de Redcliffe, 1888; Aurangzib, 1892; Saladin, 1898; Babar, 1899; Watson Pasha, 1919. He died Dec. 29, 1931.

Lanercost. Parish and village of Cumberland, England. It stands on the Irthing, 11 m. N.E. of Carlisle. Here was an Augustinian priory founded by Robert des Vaux about 1169 and dedicated to S. Mary Magdalene. The nave still exists and is used for a church, but the choir, in which are the tombs of the Dacres, is a ruin. In 1928 the ruins were given to the nation. The station is Brampton, 2 m. away. The *Chronicle of Lanercost*, covering the period 1201-1346, is named after the priory, but was written at Carlisle. It is valuable for the affairs of the north of England in the time of Edward I and Edward II. It was edited by J. Stevenson, 1839.

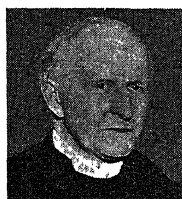
Lanfranc (c. 1005-89). Archbishop of Canterbury. Born at Pavia, Italy, and educated as a jurist, he migrated to Normandy and founded a college at Avranches. In 1042 he entered the Benedictine abbey of Bec, near Rouen, of which in 1045 he became prior, having Anselmo, later Pope Alexander II, as one of his pupils and Duke William as a friend. He at first condemned and then condoned William's marriage with Matilda of Flanders, and when the duke founded the monastery of S. Stephen at Caen was in 1066 nominated its first abbot. Having refused the see of Rouen, he was made archbishop of Canterbury in 1070.

As primate he is remembered for his efforts to purify English monasticism; his zeal for the enforcement of clerical celibacy, though he made an exception in favour of parish priests who had married before the decree of 1076; and his works of charity. After the fire of 1067 he rebuilt Canterbury Cathedral in Norman style, founded the hospital of S. John outside Canterbury, and the leper-house of S. Nicholas, Harbledown. He crowned William II in 1087, and

was on the king's side in the rebellion of 1088, courageously attempting to curb his excesses. He died May 24, 1089, and was buried in Canterbury Cathedral.

As a theologian, Lanfranc took a prominent part in the controversy with Berengar of Tours, 1050, on the question of transubstantiation (*q.v.*). He cleared himself before Leo IX of the charge of sympathising with Berengar, and set forth his views in the treatise *De Corpore et Sanguine Domini*, arguing that the elements in the Eucharist are incomprehensibly converted through consecration into the Body and Blood of Our Lord, while their external form and appearance remain. His works, including commentaries on the Epistles of S. Paul and Sermons, were edited by J. A. Giles, 1844. A recent *Life* is by A. J. Macdonald, 1926.

Lang, COSMO GORDON, BARON (1864-1945). An archbishop of Canterbury. Born Oct. 31, 1864,



Lord Lang, Arch-
bishop of Canterbury

a son of the Very Rev. J. M. Lang, Presbyterian divine, he went to Glasgow university and Balliol College, Oxford. He became a student of the Inner Temple, but in 1899 abandoned the law and went to Cuddesdon theological college. Ordained 1890, he was a Leeds curate, then vicar of St. Mary's, Oxford, 1894, and of Portsea, 1896. In 1899 he was made an honorary chaplain to Queen Victoria; in 1901 bishop-suffragan of Stepney; and he was selected as archbishop of York in 1908, with no previous experience as a diocesan. Here the appeal of his preaching owed much to his beautiful voice.

Dr. Lang took a leading part in preparing the revised Prayer Book which parliament rejected in 1927. On Dec. 4, 1928, following the resignation of Randall Davidson, he was enthroned as archbishop of Canterbury. He organized the highly successful Lambeth conference of 1930. In 1936 he was widely criticised for the part he played at the time of Edward VIII's abdication, and particularly for his broadcast on the Sunday following that event, but the sincerity of his motives was never questioned. He crowned George VI in Westminster Abbey, May 12, 1937. The advent of war

prevented him from fulfilling his intention of retiring at 75; but in 1942 he made way for a younger man, and was created Baron Lang of Lambeth. He received the King's Cottage at Kew Green as a residence, and died Dec. 5, 1945.

Lang, (ALEXANDER) MATHESON (1879-1948). British actor. Son of a parson, and cousin of Cosmo



Matheson Lang,
British actor

Lang (*v.s.*), he was born at Montreal, May 15, 1879, and educated at St. Andrews university. Making his first stage appearance at Wolverhampton, 1897, and joining Benson's company, he made his London debut in 1900 at the Lyceum in Shakespearian repertory. A fine character actor, he excelled in melodramatic parts like Mr. Wu, 1913. He created the part of The Wandering Jew, 1920, and appeared in Blood and Sand; Such Men are Dangerous; Jew Süß; For the Defence, 1935. On April 11, 1948, he died in Barbados. His reminiscences, Mr. Wu Looks Back, came out in 1940. His wife, Hutin Britton, often acted with him.

Lang, ANDREW (1844-1912). Scottish author and editor. Born at Selkirk, March 31, 1844, he was educated at Edinburgh Academy, St. Andrews University, and Balliol College, Oxford, afterwards becoming hon. fellow of Merton. One of the most versatile and graceful of writers, he was responsible for more than sixty books and a vast amount of literary journalism printed on both sides of the Atlantic, and notably in the Daily News.

In poetry he was author of Ballades and Verses Vain, 1884; Grass of Parnassus, 1888; and Ban and Arrière Ban, 1894; while he translated Theocritus, 1880, Homer's Iliad (with S. H. Butcher), and the Odyssey (with W. Leaf and E. Myers). He wrote Lives of Sir Stafford Northcote (Lord Iddesleigh), 1890; J. G. Lockhart, 1897; and Alfred Tennyson, 1901. The supernatural interested him deeply, as witness his Custom and

Myth, 1884; Myth, Ritual, and Religion, 1887; Cock Lane and Common Sense, 1894; Modern Mythology, 1897; The Making of Religion, 1898; and Magic and Religion, 1901.

His History of Scotland appeared in 1900-7; Pickle the Spy, 1897; The Companions of Pickle, 1898; Prince Charles Edward, 1900; The Mystery of Mary Stuart, 1901; The Valet's Tragedy, 1903; Historical Mysteries, 1904; John Knox and the Reformation, 1905; Portraits and Jewels of Mary Stuart, 1906. He was the author of a notable work on Joan of Arc, The Maid of France, 1908. His contributions to general literature included Books and Bookmen, 1886; Letters to Dead Authors, 1886; a translation of Aucassin and Nicolette, 1887; Letters on Literature, 1889; and Lost Leaders, 1889.

In fiction he collaborated with H. Rider Haggard in The World's Desire, and wrote The Mark of Cain, 1886, and A Monk of Fife, 1896. He edited Longman's Magazine and numerous fairy books, and was an original member of the Psychical Research Society. He died July 20, 1912.

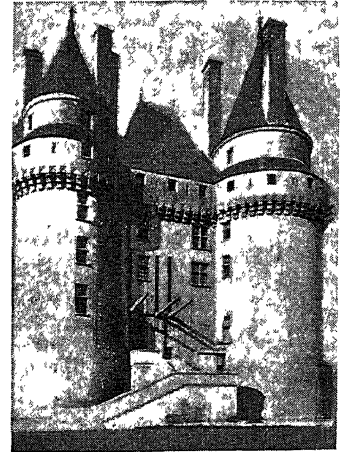
From this selective list of his works it can be seen that Lang was a man of many parts and great enthusiasm. He was respected by his greater literary contemporaries, but perhaps underestimated after his death, having never achieved any outstanding work of either scholarship or creative genius. By many he is best remembered, and with gratitude, through his editorship of those one-time nursery classics, the Green, Red, Blue, Yellow, and Violet Fairy Books, anthologies of fairy lore from all over the world. Consult Portraits and Sketches, E. Gosse, 1912; Andrew Lang, R. L. Green, 1946.

Langdale. Name of two hills, or pikes, and two valleys in the Lake District of England. In Westmorland, nr. Grasmere, Great Langdale is a valley 5 m. long, reaching from the Cumberland border to Elterwater; the Langdale beck flows through it. Little Langdale is 3½ m. long and meets Great Langdale at Elterwater. The pikes are at the head of Great Langdale: they are 2,400 and 2,320 ft. high, and are known as Harrison Stickle and Pike o' Stickle respectively. Langdale is also the name of a village in Great Langdale, 4 m. N.W. of Ambleside.

Lange, CHRISTIAN LOUIS (1869-1938). Norwegian pacifist, born Sept. 17, 1869, at Stavanger. From 1900 to 1911 secretary of the Nor-

wegian Nobel prize committee, he became in 1909 secretary of the Interparliamentary Union. Delegate for Norway at the League of Nations in 1920, he became a close collaborator with Nansen. Respected at Geneva for his humanitarian and pacifist activities, Lange was awarded in 1921, together with the Swedish Socialist leader Branting, the Nobel peace prize. Among his writings stands out a searching History of International Relations from 1814, whose publication began in 1919. He died Dec. 11, 1938.

Langeais. Town of France, in the dept. of Indre-et-Loire. Situated on the right bank of the



Langeais, France. Towers with
main gateway of the chateau

Loire, 14 m. W.S.W. of Tours, it is famed for its chateau, begun by Pierre de Brosse in the 13th century, and finished by Jean Bourré in the 15th. It contains interesting pictures, tapestries, etc., and furniture belonging to Anne of Brittany, who was married here to Charles VIII in 1491. In the park are ruins of a 10th cent. keep.

Langeland. Island in the Baltic Sea, belonging to Denmark. It lies between Funen (Fyen) on the N.W. and Laaland (Maribo) on the S.E., and between the Great and Little Belts. Its length is 32 m., average width about 4 m., and area 106 sq. m. The chief town is Rudkjøbing. Pop. 21,000.

Langendijk, PIETER (1683-1756). Dutch poet and dramatist. Born at Haarlem, July 25, 1683, son of a bricklayer, he at first supported himself as an art designer in a damask factory at The Hague, and later obtained a similar lucrative position at Amsterdam. Here he found literary friends and recognition, and here his dramas and comedies were



Hollyer

produced, Don Quixote 1711, and De Zwetser (The Braggart) 1712. Langendijk also published several volumes of poems. He died July 18, 1756.

Langensalza. German town in Thuringia, with historic associations, and in the Middle Ages of great importance. It is on the Salza, 20 m. N.W. of Erfurt. There are fine patrician houses, the church of S. Boniface (14th century) with a 270-ft. tower, a town hall of the same period, old walls, and the neighbouring castle of Dryburg, built by a grand master of the Teutonic Order. A strong sulphur spring made it from 1811 a spa with about 5,000 visitors a year. It had textile, stone, and leather industries. After the Second Great War it was in the Soviet zone of occupation. Pop. (1949) 16,000.

Here was fought, June 27, 1866, a battle between the Hanoverians, who had taken the side of Austria, and the Prussians. The former were victorious at first, but when more Prussians arrived they were surrounded and forced to surrender. In Feb., 1761, there was an engagement here between the combined British and Prussians and the Austrians, the former being victorious; and here, April 17, 1813, the Prussians defeated the Bavarians, fighting on the side of France.

Langevin, PAUL (1872-1946). French physicist. Born in Paris, Jan. 23, 1872, he studied physics and chemistry and at the École Normale Supérieure. After working at the Cavendish laboratory, Cambridge, he returned as demonstrator to the École Normale, then at the Sorbonne joined in research with Pierre and Marie Curie. In 1902 he was appointed assistant professor at the Collège de France; in 1909 to the chair of general and experimental physics. He succeeded Curie in the school of physics and chemistry, of which he became director in 1925.

While working with J. J. Thomson at Cambridge Langevin discovered the secondary rays of X-rays, and was the first to make known in France Einstein's formula of relativity. X-rays, properties of ions, the kinetic theory of gases, molecular orientation, and magnetism were all studied by Langevin, who discovered supersonic waves and applied the theory to detection of submarines. After the occupation of France in 1940 he was imprisoned by the Germans, but was released and went to Switzerland. Scientific adviser to the French atomic energy commission, he died Dec. 19, 1946.

Langham, SIMON (d. 1376). An English ecclesiastic. Born at Langham, Rutland, he became treasurer of England in 1360, bishop of Ely 1361, chancellor of England 1363, and archbishop of Canterbury 1366. He resigned in 1368 on being made cardinal, but later held archdeacons of Wells and the West Riding. He is remembered for his expulsion of the secular clergy from Canterbury Hall, Oxford, and for having left his fortune to Westminster Abbey, where his tomb is the oldest ecclesiastical monument. He died July 22, 1376.

Langholm. Market town of Dumfriesshire, Scotland. It stands on the Esk, 16 m. N.E. of Annan, and is the terminus of a branch rly. line. It consists of two parts—Old and New Langholm—one on either side of the Esk, connected by two bridges. It has important sheep fairs, and manufactures tweed, dyeing and tanning being other industries. The chief buildings are the town hall, a library commemorating Telford, the engineer, who was born here, and a hospital, founded under the will of Thomas Hope. Made a burgh of barony in 1643, Langholm was soon known for its woollen goods. Near are Langholm Lodge, a seat of the duke of Buccleuch, and Gilnockie Tower, famous for its associations with Johnnie Armstrong. Market day, Tues. Pop. 2,448.

Langhorne, JOHN (1735-79). English poet and translator. Born at Winton, Kirkby Stephen, Westmorland, he attended schools at Winton and Appleby, became a tutor, took orders, and in 1760 entered Clare Hall, Cambridge. He was curate at Dagenham, 1761; at St. John's, Clerkenwell, 1764; assistant preacher at Lincoln's Inn, 1765; prebendary of Wells, 1777; and rector of Blagdon, Somerset, from 1766 until he died, April 1, 1779. He is best remembered for collaboration with his brother William (1721-72) in a translation of Plutarch's Lives, 6 vols., 1770. His poems, with memoir, were published by his son, J. T. Langhorne, in 1804.

Langiewicz, MARYAN (1827-87). Polish patriot. Born in Posen, Aug. 5, 1827, he made his way to Paris in 1850. After a few months of teaching he hastened to Genoa and enlisted under Garibaldi, fighting through the Sicilian and Calabrian campaigns. Two years later he played a prominent part in the Polish insurrection of 1863, routing the Russians in three pitched battles, but his vain attempt to form a stable govern-

ment was followed by an overwhelming defeat of his troops at Zagosc, March 18, 1863. He died at Constantinople (Istanbul), May 11, 1887.

Langland, WILLIAM (c. 1330-1440). An English poet. Born at Cleobury Mortimer, he became a clerk or minor priest, but further progress in the Church was barred by his being married. He came to London and earned a living chiefly by chanting dirges at funerals, an occupation which accorded well with his gloomy disposition. A tall, morose figure, he was popularly known as Long Will. The great gulf between rich and poor impressed him deeply, and the troubled lives of the workers form the theme of his forceful alliterative poem, *The Vision of Piers Plowman*. See *Piers Plowman*.

Langley, SAMUEL PIERPONT (1834-1906). American physicist and aeronautical experimenter. Born at Roxbury, Mass., he became a civil engineer before taking up an appointment, 1865, as assistant at Harvard Observatory, and in the same year as assistant professor of mathematics in the U.S. naval academy. In 1867 he became director of the Allegheny Observatory, and in 1887 secretary of the Smithsonian Institution. Langley carried out many valuable experiments in connexion with the heat of the sun, and invented the bolometer (*q.v.*).

In 1896 he built his first motor-driven model aeroplane, and, assisted by a government grant, worked at experiments and stated laws of flight which were fundamental. Trials with a man-carrying aircraft failed in 1903 (the year of the Wrights' success); but not much later a Langley machine was re-engined and successfully flown. The pioneer died Feb. 27, 1906. The principal U.S. aeronautical research station (in Virginia) was named Langley Field.

Langmuir, IRVING (b. 1881). American physicist and chemist, born in Brooklyn, Jan. 31, 1881. He was lecturer on chemistry at Hoboken, 1906-09, and thereafter chemist of the General Electric Co. at Schenectady. An authority on condensation of electric power and the technique of vacuum valves, he invented a gas-filled tungsten lamp and an electron discharge apparatus. His findings on charges and saturation currents were of great importance for the study of the electron, and he discovered the atomic form of "heavy" hydrogen. He received in 1932 the Nobel prize for physics,

and the Hughes, Faraday, and Rumford medals.

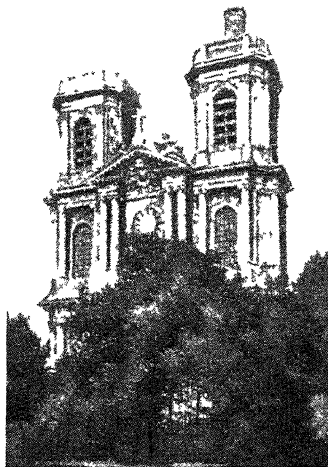
Lango. A Nilotic negro people inhabiting the Lango dist. of the W. prov. of Uganda. Estimated at 350,000, with 115 exogamous clans, they are tall, dark, well-built hunters and cultivators, subsisting mostly on millet, with sorghum, ground-nut, beans, and sweet potato. They practise scar-tattooing; pierce nose, lips, ears, and even tongue, eyebrows, and navel for brass rings and beads; and wear bead waistbelts and metal coils. They use spears, spiked wristlets, and hide shields. At night sheep, goats, and calves share their dome-shaped huts of mud and thatch. Boys occupy huts raised on 8-ft. poles, and granary tubs are poised on stone posts.

Langport. A market town of Somerset, England. It stands on the Parret, 13 m. N.W. of Yeovil. Until 1906, when the G.W.R. line was opened between Castle Cary and Taunton, there was trade along the river to Bridgwater. All Saints is a fine Perpendicular church, near which is an old "Hanging Chapel," which stands on an archway over the road. It was used in turn as a grammar school, a museum, and is now a masonic hall. There were a British and a Roman settlement here, the place being well situated for defence. It became a borough in medieval times, and was long a prosperous inland port with three annual fairs. The Act of 1883 deprived it of its privileges as a borough. Pop. 686.

Langport was the scene of an engagement during the Civil War. After Naseby, Fairfax advanced into the W. to deal with the royalist force under Goring which was still in the field. Leaving the siege of Taunton, Goring entrenched himself near Langport, but his position was turned, and he was forced to fight on July 10, 1645. Although numerically superior, the royalists were beaten.

Langreo. Town of Spain, in the prov. of Oviedo. It stands on the river Nalon, 11 m. by rly. S.E. of Oviedo. The town contains several foundries and cloth factories, while in the surrounding district are coal and iron mines. Pop. 37,500.

Langres. Town of France, in the dept. of Haute-Marne. It lies 21 m. S.S.E. of Chaumont, and is capital of an arrondissement. The rly. station lies 1 m. from the town. The manufacture of cutlery, leather, and vinegar are leading industries, and there is a considerable agricultural trade. The cath-



Langres, France. West front of the cathedral of S. Mammès, an 18th century addition to the structure

edral of S. Mammès is a 12th century Transitional building, with 18th century additions, and contains notable statues and tapestries. There is a town museum and picture collection. Langres was known to the Romans as Andemantunnum, capital of the Lingones, whom they subjugated in A.D. 71. It was destroyed by Hun and Vandal invaders, and in 1814 was occupied by the Austrians.

The plateau of Langres, on which the town stands, rises at the Haut du Sec to a height of over 1,500 ft.

Langsdorf, HANS (d. 1939). A German sailor. He commanded the German battleship Admiral Graf Spee at the beginning of the Second Great War, and by Hitler's order, after the battle of the River Plate, scuttled his ship outside Montevideo, Dec. 17, 1939. On Dec. 19 he spent three hours in consultation with his staff officers, wrote his last letters and dispatches, and gave away personal effects; the next morning he was found shot dead. See Plate, Battle of the River.

Langside. A historic spot in Scotland, now included in the city of Glasgow. It is in the parish of Cathcart, and has its own railway station. It was a village when on May 13, 1568, the troops of Mary Queen of Scots, about 6,000 strong, were met by about 4,500 under the regent Murray. The battle was over in less than an hour, Kirkealdy of Grange leading a cavalry charge that routed the queen's forces. From Langside Mary fled to England. A monument commemorates the battle. See Mary Queen of Scots.

Lang's Nek OR LAING'S NEK. A pass through the Drakensberg Mts. in Natal. Near the borders of the Orange Free State and the Transvaal, it is nearly 6,000 ft. high. A railway line goes through the pass by a tunnel over a mile long, as the Nek is on the direct route from Durban to Pretoria.

During the war between the British and the Boers in 1880-81, the Boers occupied the Nek, where they were attacked by a small force under Sir G. Colley, Jan. 28, 1881. The latter was driven back, and the action of Majuba followed. There was fighting in the pass during the S. African War, especially in May-June, 1900. The pass is often called Laing's Nek, but inquiry shows that the man after whom it was named was Lang.

Langson. Town of Tongking, Vietnam. It is situated 12 m. from the Chinese frontier, 82 m. by rly. N.E. of Hanoi, on a line to Lungchow. Of both strategic and commercial importance, it saw many conflicts in the early days of French occupation.

Langstrothdale. Name given to the upper valley of Wharfedale, Yorks, where the river Wharfe is little more than a moorland stream among the E. slopes of the Pennines. There are several small farming hamlets set amid wild and beautiful mountain scenery.

Langton, SIR GEORGE PHILIP (1881-1942). British judge. Born at Danganmore, Kilkenny, April 22, 1881, he was educated at Beaumont and New College, Oxford, and called to the bar at the Inner Temple in 1905. During the First Great War he was an artillery officer before taking up duties at the ministry of Labour in 1916. He took silk in 1925, and in 1930 was knighted and made a judge of the high court; he sat in the probate, divorce, and admiralty division, the first Roman Catholic to preside over a divorce court. He was drowned in the Parret estuary, Aug. 8, 1942.

Langton, STEPHEN (d. 1228). English prelate and statesman, whose parentage is unknown. He studied at Paris, and in 1206 was made a cardinal by Innocent III. Being soon afterwards elected archbishop of Canterbury, he was rejected by King John and obliged to take refuge in France. The pope intervened and John pretended to yield, but would not grant a safe conduct, so Langton remained in France until 1212, when he begged Innocent to save England from ruin. Under threat of deposition, John gave way, and Langton, as

primate, entered upon a contest against kingly tyranny and papal usurpation. In 1215 he had a large share in securing Magna Carta from John, but by false representations the pope was induced to take the king's side, and Langton was suspended, not being restored to the primacy until John's death. In 1220 he succeeded in getting the papal legate removed, and at the council of Osney in 1222 instituted a valuable canonical code. In 1223 he procured the confirmation of Magna Carta, and in 1225 defended the English Church against fresh levies demanded by Rome. He died July 9, 1228, and was buried in Canterbury Cathedral. Langton was a renowned theologian, his Commentaries finding a place in all medieval libraries. See John; Magna Carta; consult Life, F. M. Powicke, 1928.

Langtry, EMILY CHARLOTTE (LADY DE BATHE) (1852-1929). British actress, known as Lily Langtry. Daughter of W. C. E. Le

Breton, dean of Jersey, she was born Oct. 13, 1852. She made her début on the London stage at the Haymarket in 1881, as Kate Hardcastle in *She Stoops to Conquer*, and later appeared under her own management in London and the U. S. A. The "Jersey Lily" was recognized as one of the most beautiful and admired women of her day, popular in London society and a friend of the Prince of Wales (Edward VII). In 1874 she married Edward Langtry (d. 1897), and in 1899 Sir Hugo de Bathe. During her later years she kept a large stable of racehorses. She published reminiscences, *The Days I Knew*, in 1925. She died at Monte Carlo, Feb. 12, 1929.



Lily Langtry,
British actress
Ellis & Walery

such as Sanskrit, Greek, or Latin, the function of the word is indicated by inseparable affixed elements and/or by internal mutations. To translate from Latin into a markedly analytical language, such as English, we have to dissolve complex structures into their component parts and assign different words to the different units. In this way the single Latin *cantabimus* becomes "we shall sing," and Latin *ignoto militi* equals "to the unknown soldier." There is strong evidence in support of the belief that the declensional and conjugational endings of Indo-European languages were once words in their own right before they agglutinated and intimately fused with the word-base. The history of the Romance future-tense supplies an impressive example of the process. Latin *canta-bo* gave way in Vulgar Latin to *ego cantare habeo*, literally "I to sing have," and this analytical construction became *je chanter-ai* in French and *io canter-ò* in Italian. Throughout the Indo-European family there has been a persistent drift from the flexional to the analytical pattern. French and German stand today midway between the two; English, which at the time of Alfred the Great was still heavily inflected, has travelled farther on the road to analysis than any other tongue spoken in Europe.

No Backward Languages

Attempts have often been made to correlate the structure of a language with the cultural level of the people who speak it. Such attempts are futile. There remain backward societies; there are no backward languages. Because of their amazing conservatism and haphazard growth all languages are, to a greater or lesser degree, infested with features inherited from the dim past which have long ago ceased to serve any useful purpose. For the unchanging English the speakers of French quite unnecessarily use three different forms (*le, la, les*), not counting contractions. Likewise, English-speaking people add a superfluous hiss to the verb when referring to the third person (*he hit-s*).

What people possess, do, think, or feel is accurately reflected by their vocabulary, and not by their grammar. Generally speaking, a society has names only for those things or events with which it is familiar. If its members live without banks, they do not need a name for the institution. But however backward a community may be it is never barred by the structure of

LANGUAGE: ITS ORIGIN AND GROWTH

Frederick Bodmer, Ph.D., Author of *The Loom of Language*

Varieties of speech and its tendencies are here described. Other aspects of language are treated under the separate letters of the alphabet, also under Alphabet; Hieroglyphics; Philology; Phonetics, etc.

Language (Lat. *lingua*, tongue) is a system of auditory or visual signs by means of which men co-operate and transmit to one another their accumulated experience. It is as characteristic a human habit as the use of tools and may be coeval with it. When man first talked, why he talked, and how he talked are guesswork. There are no languages, ancient or modern, that would allow us a glimpse of primitive speech, nor are we able to bridge the abyss that yawns between the modest phonetic performance of the ape and that of man. Several theories have been put forward to account for the origin of language. One holds that man's first words were sound-imitations; another that they were emotive cries; a third that they grew out of the noises which accompany strong muscular effort; a fourth, more recent, puts gesture-language before speech, and suggests that tongue and lips mimicked what the hands did or would have done in the same situation.

All these speculations are equally unconvincing. There is no reason why, in the beginning of speech, the relation between sound and meaning should not have been as arbitrary as it is in the words *arm hand, leg*. Besides, the words in

which a direct sound-sense relation appears to exist, as in *hollow, slip, thin*, represent a negligible part of the vocabulary of any language. It is not likely that we shall know anything more definite about how man hit upon the trick of using noises as symbols for things until we know more about how children acquire and use speech.

Mankind is today burdened with some 1,500 languages, which vary enormously in sound, grammar, and sentence construction. There are two principal ways of introducing order into the diversity of tongues. One is to group them according to genetic relationship. Thus, comparative philologists unite in a huge Indo-European family all those languages (English, French, Russian, Persian, Hindi, etc.) which are evolutionary forms of what is assumed to have been a single tongue. The second classificatory method proceeds from this or that set of structural patterns and assigns languages to, e.g., the analytical, the agglutinative, the flexional type. In an analytical language, such as Chinese, the word is a solid unalterable block. There are no external or internal changes to reveal what part it plays in the sentence. In a predominantly flexional medium,

its language from adapting its vocabulary to the new needs which culture-diffusion creates. A simple and universally practised method of vocabulary expansion is that of borrowing words. Thus English received STREET (Lat. *strata via*, paved way), DISH (Lat. *discus*, disk), RADISH (Fr. *radis*, Lat. *radicem*, root), PYJAMAS (Persian *pae jamah*, leg-clothing). Nowadays words travel farther afield than in the past, and at an ever increasing rate of speed till they become the property of the entire world. Among such globe-trotters are BEER, CIGARETTE, HOTEL, RADIO, TEA.

Culture-diffusion does not invariably lead to copious word-borrowing. A language-community may enrich its vocabulary out of its own native resources, either by enlarging the meaning-area of an already existing word, or by translating (loan-translation) or paraphrasing a foreign term. Thus English SUPERMAN is a literal version of German *Übermensch*, German *Fernsprecher* renders TELEPHONE, and both English CALLING (occupation) and German *Beruf* are loan-translations of late Latin *vocatio*. Languages differ widely in their treatment of foreign material. English, for instance, has never closed its doors to immigrant words, whereas Chinese and, to a lesser degree, German and Czech show a strong bias in favour of translating or paraphrasing them before they are admitted.

Borrowing is not confined to words or idiomatic expressions. Languages may also appropriate prefixes and suffixes together with foreign items, and sooner or later rivet them to native terms, as English did with *-able* (Fr.) in EATABLE, DRINKABLE, or with *-ess* (Fr. *-esse*) in MURDERESS and SEAMSTRESS. But there is little evidence that a language under the impact of another has altered its structural core by borrowing e.g. a new plural formation or a whole set of tense-endings.

Artificial Languages

As early as Old Testament times there were people who chafed at the multiplicity of tongues, possibly because it interfered with trade. Attempts to remove the evil by designing a medium over and above regional speech were not made till the 17th cent. Since the Aberdonian schoolmaster Dalgarno published his Art of Symbols (1661) and Wikins, bishop of Chester, his Real Character (1668), several hundred artificial languages have either been outlined or fully elaborated

the bulk of them during the second half of the 19th and the beginning of the 20th cent. There were several reasons for the increased output. Steamboat, railroad, and telegraph had made the planet shrink. Trade began to knit the most distant parts of the world into an economic whole. More people travelled and travelled farther than before. But always there were these irksome language barriers. Was there no other way of breaking them down except by mastering several tongues, relying on translations and interpreters? After all, there was a common calendar, a common system of numeration and musical notation, an international Morse code, and a postal union. Why not a supranational language?

New material needs received strong support from the growth of pacifist sentiment, especially after the Franco-Prussian war. More than one language inventor nursed the hope that with the emergence of a world tongue all political and economic rivalries would disappear.

From Esperanto to Basic English

The earliest schemes had no regard to existing speech. The more recent ones take their material from ethnic languages, living and dead. Thus Zamenhof's Esperanto (1887) is essentially a Romance language, heavily interlarded with Teutonic elements; de Wahl's Occidental (1922) sticks mainly to Latin and neo-Latin; Peano's Latino sine Flexione (1903) is, as the name implies, a simplified Latin; Hogben's Interglossa (1943) favours extreme analysis in structure and the hybridisation of Latin with internationally current Greek roots. The inventors of these and most other artificial languages are bound together by the common endeavour to simplify their grammars, either by streamlining the flexions they incorporate, and/or by reducing their number to what they consider strictly functional. Ogden's Basic English stands apart from all these synthetic products. It starts from the undeniable fact that English is on the way to becoming World English. It is habitually spoken by some 200 million people, dispersed throughout the globe, and functions as an indispensable *lingua franca* in the Middle and Far East. Furthermore, it can boast of several other merits, including its advanced analytical structure, that commend it as a world medium. To increase its learnability and hence its diffusion, the inventor of Basic simplified it in two ways. One was to rid

it of several of its adherent complexities and irregularities. The other and more important one was to design a scientifically selected minimum vocabulary that combines extreme economy with maximum efficiency. Whatever its future, Basic English can claim to be the first successful attempt at rationalising a living language.

Our mouth- and ear-language is as old as man; our eye-languages are not older than the beginning of the urban way of life in Egypt and Mesopotamia, India and China. For more than four out of the five thousand years of its record the use of visible signs, carved into stone, stamped into clay, and written on leaves or skins, remained subservient to the spoken word. This is no longer true. The autonomy of the written language is as characteristic of current civilization as speech is distinctive of *homo sapiens*. What we call knowledge is today primarily stored away in print and not in the memories of living men and women. But the invention of the gramophone record and the sound-track has made speech as enduring as the material in which it lies embedded; radio and the long-distance telephone send it instantaneously into the most distant corners of the world.

Bibliography. Language, E. Sapir, 1921; Language: its Nature, Development, and Origin, O. Jespersen, 1923; The Meaning of Meaning, C. K. Ogden and I. A. R. Richards, 1923; Language, L. Bloomfield, 1935; The Tongues of Men, J. R. Firth, 1937; The Gift of Tongues, M. Schlauch, 1943; The Loom of Language, F. Bodmer, ed. L. Hogben, 1944.

Languard, Piz. A mountain of Switzerland, and a peak of the Bernina Alps. It is in the Upper Engadine, close to Pontresina, and reaches an alt. of 10,715 ft. It is a favourite climb for tourists.

Languedoc. One of the provinces into which France was divided before the Revolution. It covered the south-central part of the country, stretching from the Pyrenees almost to the Loire; on the E. it was bordered by the Rhône. The name arose in a curious way. The people living there pronounced the word for yes as *oc*, not as *oui* as they did elsewhere; their speech, therefore, became the *langue d'oc* and their land Languedoc.

This was a prosperous and populous part of the Roman Empire, afterwards passing under the rule of the Franks. Its chief town was Toulouse, and in the Feudal

Age the counts of Toulouse were extremely powerful, practically dominating the province for over two centuries. In the 13th century, after the suppression of the Albigenses, Languedoc was divided, and the king of France took the E. part away from the count. The W. part, the county of Toulouse, and its dependencies passed to the king a few years later. Civil wars were frequent, caused by the persecution of heretics, the Albigenses and later the Camisards, and by the ill-feeling between Catholics and Protestants in the 16th century. There were other wars of secular origin, in the 14th century and in the time of Richelieu. Since the Revolution, Languedoc has been divided into the departments of Haute-Garonne, Ariège, Pyrénées-Orientales, Aude, Hérault, Tarn, Aveyron, Gard, Lozère, and Ardèche. See France.

Langur OR **HANUMAN** (*Semnopithecus entellus*). Hindu names of the sacred monkey of India. It belongs to a group of Asiatic monkeys distinguished by their slender bodies, very long tails, and the absence of cheek pouches. There are several species, common in India and in most parts of S.E. Asia. They feed mainly on leaves and the tender shoots of trees.

Lankester, Sir (Edwin) Ray (1847-1929). A British scientist, born May 15, 1847, the son of



Edwin Lankester (1814-74), zoologist and authority on health. He was educated at S. Paul's and Downing College, Cambridge, and won

a travelling fellowship at Oxford, where he began his career as lecturer at Exeter College. During 1874-90 he was professor of zoology at University College, London, then for eight years Linacre professor of comparative anatomy at Oxford. In 1898 he was appointed director of the Natural History departments at South Kensington, and there remained until 1907, when he was knighted. He died Aug. 15, 1929.

As a zoologist and follower of Darwin and Huxley, Lankester was in the first rank. In 1875 he became a fellow of the Royal Society, gaining the royal medal in 1885 and Copley medal in 1913. In 1906 he was president of the

British Association. He founded in 1884 the Marine Biological Association. His writings include *Degeneration*, 1880; *The Advancement of Science*, 1889; *The Kingdom of Man*, 1907; *Science From an Easy Chair*, 1910-12; *Science and Education*, 1919; *Great and Small Things*, 1923. He edited *A Treatise on Zoology*, 1900-09, and *The Quarterly Journal of Microscopical Science* and pioneered the popular science article in his many contributions to daily newspapers.

Lanner (*Falco feldeggii* or *F. biarmicus*). Species of small falcon, found around the Mediterranean.



Lanner. Specimen of the small Mediterranean falcon

Its plumage is brown on the upper parts, with barred back and blackish head and a reddish neck. The adult male measures about 17 in. in length. See Falcon.

Lannes, Jean (1769-1809). A French soldier. Born at Lectoure, April 11, 1769, of humble parent-



Jean Lannes, French soldier

age, he entered the army at the outbreak of the Revolutionary wars. His rise was rapid, and his services in Italy in 1796 won him the rank of general. He went with Napoleon to Egypt, and in 1800 held a command in Italy, where he was responsible for the victory at Montebello and partly for that at Marengo. He was sent in 1801 as envoy to Portugal, but was soon in the field again. At Austerlitz, Jena, Eylau, and Friedland he added to his fame, and in Spain he took Saragossa. In 1809 he commanded the centre

at Aspern, but both his legs were shot off, and he died in Vienna, May 31; his remains were buried in Père-Lachaise. Lannes is regarded as one of the ablest and most trusted of Napoleon's marshals. For his services he was made duke of Montebello.

Lanolin (Lat. *lana*, wool; *oleum*, oil). Purified fat of sheep's wool that has been mixed with water. A white or yellowish-white substance insoluble in water, its chief constituents are cholesterol and the esters of stearic, palmitic, oleic, and other acids. Mixed with oil or soft paraffin, it is more readily absorbed than most fats when rubbed into the skin, is partly antiseptic; hence is the basis of face creams and ointments. Wool fat mixed with water is known as anhydrous lanolin.

La Noue, François de (1531-91).

French Huguenot soldier. Born near Nantes, he served under arms in Italy, and returning to France espoused the cause of the Calvinists in the wars of religion. His capture of Orléans, 1567, was followed by successes at Jarnac, 1569, Fontenay, 1570, and at Oléron and Soubise. At Fontenay

he lost an arm, and the iron substitute gave him his sobriquet of Bras de Fer. After the peace of St. Germain, 1570, he fought against the Spaniards in the Nether-



François de la Noue, French soldier

lands, taking part in the unsuccessful defence of Mons against Alva. Governor of La Rochelle 1574-78, he was captured by the Spaniards when again fighting in the Netherlands in 1580, and was kept prisoner until exchanged in 1585. While a prisoner, La Noue wrote his most famous book, *Discours Politiques et Militaires*, 1587, repr. 1850. From 1589 he aided Henry of Navarre, and was wounded whilst besieging the château of Lamballe, 1591, dying on Aug. 4.

Lansbury, George (1859-1940). British Labour politician. Born Feb. 21, 1859, at Halesworth, Suffolk, he was educated at elementary schools. In Australia, 1884-85, he worked as a labourer; on his return he entered his father-in-law's timber business. He served as a poor law guardian, a borough councillor, and a member of the L.C.C. Returned as Labour M.P. for Bow and Bromley in 1910, he gave up his seat two

years later to contest it as an independent supporter of woman's suffrage, but was defeated, and did



George Lansbury,
British politician

not return to the House until 1922, again for Bow and Bromley, which he represented until his death. He was imprisoned in 1913, following a suffragist speech, and again in 1921, together with the rest of the Poplar Council, which refused to levy rates for the L.C.C. because of the borough's poverty. He edited the *Herald*, as a weekly and as a daily (*Daily Herald*), during 1914-22.

First commissioner of works in the Labour ministry of 1929, he instituted an enclosure for mixed bathing in the Serpentine, Hyde Park, which received the popular name of Lansbury's Lido. After MacDonald became premier of the National government in 1931 Lansbury led the parliamentary Labour party, but, being a pacifist, stood down in 1935 when the Labour party and the T.U.C. supported sanctions against Italy. Generally respected, he was beloved in the Labour movement. He died, May 7, 1940.

His publications included *What I Saw in Russia*, 1920; *My Life*, an Autobiography, 1928; *My England*, 1934; *My Quest for Peace*, an account of his journey in 1937 to plead for peace with Hitler and Mussolini, 1938. A biography by his son Edgar appeared in 1934.

Lansdell, HENRY (1841-1919). British traveller and divine. Born at Tenterden, Kent, Jan. 10, 1841, and educated

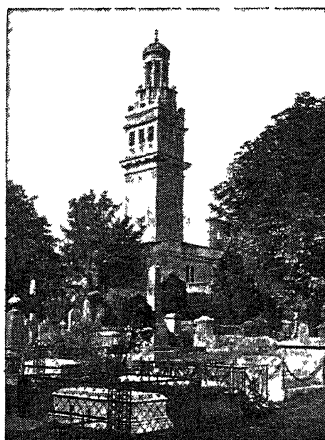


Henry Lansdell,
in Gilyak costume

privately and at S. John's Divinity College, Highbury, Lansdell was ordained in 1867; curate at Greenwich, 1868, and Eltham, 1885-86; and chaplain at Morden College, Blackheath, 1892-1912. Taking an active interest in mission, hospital, and prison work, between

1870 and 1904 he travelled through Europe and Asia, part of Africa, and across America. He founded and edited *The Clergyman's Magazine*, 1875-86; and wrote *Through Siberia*, 1882; *Russian Central Asia*, 1885; *Chinese Central Asia*, 1893; *The Sacred Tenth*, 1906; *The Tithe in Scripture*, 1908. He died Oct. 5, 1919.

Lansdown. Hill in Somerset, just outside Bath, known for the battle fought here during the Civil War, July 5, 1643. The parliamentary army, alarmed at the royalist successes in Devon and Cornwall, was standing on the defensive to protect Bath, doing this by holding Lansdown Hill. It was led by Sir William Waller and was attacked



Lansdown Hill, near Bath. Cemetery and Beckford's Tower, 130 ft. high, built by William Beckford

by the royalists under Sir Ralph Hopton and Sir Bevil Grenville. They pressed within the enemy's breastworks and Waller retired to a position in the rear. The king's troops were too spent to do anything more and withdrew towards Oxford. They had lost 1,400 out of 2,000 engaged in the main assault, the killed including Grenville. The hill is 813 ft. high, and on it is Beckford's Tower, erected by the author of *Vathek*. See *Civil War*.

Lansdowne, MARQUESS OF. British title borne since 1784 by the families of Fitzmaurice, Petty, and Nairne. Thomas Fitzmaurice (d. 1280) was created baron of Kerry. A long succession of barons followed, having extensive lands in Kerry, and in 1722 the 21st baron was made earl of Kerry, and the family's connexion with England began. The first earl's younger son, John, inherited the estates of his uncle, Henry Petty, earl of Shelburne, and was himself

made earl of Shelburne in 1753. His son, the 2nd earl, in 1784 was created marquess of Lansdowne (*v.i.*), and the 3rd marquess inherited the earldom of Kerry. The latter and the 5th marquess are separately treated. When the 7th marquess was killed in the Second Great War on Aug. 20, 1944, the title passed to his cousin, George Mercer Nairne (b. Nov. 27, 1912). The family seats are Bowood, Wilts; Meikleour House, Perthshire; and Derreen, Kerry.

Lansdowne, WILLIAM PETTY, 1ST MARQUESS OF (1737-1805).

A British statesman. The son of

John Petty Fitzmaurice, afterwards earl of Shelburne, he left Oxford without a degree, joined the army, and served with distinction in the Seven Years' War. Succeeding to his father's peerage, he joined Bute's party, but soon went over to Pitt, and opposed the government's American policy. In 1766, in Pitt's ministry, he took charge of colonial affairs, but resigned in 1768.

During the War of American Independence, Shelburne opposed coercion. He was home secretary under Rockingham, and in 1782 succeeded him as premier. He was, however, turned out by North and Fox in 1783, and never again held office. Created marquess of Lansdowne in 1784, he lived in retirement at Bowood, where he accumulated his wonderful library, including the MSS. purchased by the British Museum in 1807. He died May 7, 1805.

Lansdowne, HENRY PETTY-FITZMAURICE, 3RD MARQUESS OF (1780-1863). British statesman.

Born July 2, 1780, son of the 1st marquess, he was educated at Westminster, Edinburgh University, and Trinity College, Cambridge. In 1802 he entered the house of commons as M.P. for Calne, and in 1806 became chancellor of the exchequer as a follower of Fox, having just succeeded Pitt as M.P. for Cambridge university,



1st Marquess of
Lansdowne
After Reynolds



3rd Marquess of
Lansdowne,
British statesman

He made some arrangements for meeting the war debt.

In 1809 he succeeded to the marquessate and was already a leader of the Whig party in debate and Society. He opposed the slave trade and favoured Roman Catholic emancipation. In 1827-28 he was home secretary. In 1830 Lansdowne became lord president under Grey, and retained the office under Melbourne, showing a real interest in education. Again lord president 1846-52, he declined the post of prime minister, but was in the cabinet under Aberdeen and Palmerston, 1852-58. He became unofficial adviser to the queen on political matters before he died at Bowood, Jan. 31, 1863.

Lansdowne, HENRY CHARLES KEITH FITZMAURICE, 5TH MARQUESS OF (1845-1927). British statesman.



Lansdowne
Elliott & Fry

Born Jan. 14, 1845, the elder son of the 4th marquess, he was educated at Eton and Balliol College, Oxford, and succeeded to the peerage and estates as he came of age. Adhering to the Whig traditions of his family, he joined the Liberal ministry as a lord of the treasury in 1869, and in 1872-74 was under-secretary for war. In 1880 he was made under-secretary for India, but resigned on disagreeing with a measure affecting Irish land. In 1883 he went to Canada as governor-general, and in 1888 was transferred to India as viceroy, a post he held until 1893.

By this time the marquess had joined the Liberal Unionists, and was secretary for war under Salisbury from 1895. When the S. African War broke out, he was blamed for the unpreparedness of the British army; but his position in the party remained unimpaired, and in 1900 he was transferred to the Foreign office, being secretary until 1905. The Anglo-Japanese alliance and the Entente Cordiale with France were largely his work. He led the Unionists in opposition in the lords from 1906. In 1915, when a Coalition government was formed, he joined as minister without portfolio, but resigned in 1916. In Nov., 1917, he came forward to advocate overtures for peace with Germany, a move for which he was strongly criticised, though his sincerity of motive was

unquestioned. Lansdowne, who was a K.G., married a daughter of the 1st duke of Abercorn. He inherited from his mother the barony of Nairne and estates in Scotland. He died June 3, 1927. A Life by Lord Newton appeared in 1929.

Lansdowne House. Former London residence of the marquess of Lansdowne. On the S. side of Berkeley Square, its grounds were separated from those of Devonshire House by a sunken footpath, Lansdowne Passage, leading from Hay Hill to Curzon Street. The mansion was built in 1766 from designs by the brothers Adam, for the 3rd earl of Bute, who sold it, still unfinished, for £22,500 to the earl of Shelburne, later 1st marquess of Lansdowne. While librarian here in 1774, Priestley (*q.v.*) discovered oxygen.

Lansdowne House was let to Gordon Selfridge in 1921. Largely rebuilt, with new frontages to S. and W., it was opened in 1932 as the Lansdowne Club, and the name Lansdowne House given to a block of flats and shops erected on a site immediately to the E., now the home of the National Coal Board. The original plans and drawings are preserved in the Soane Museum.

Lansing. Capital of Michigan, U.S.A., in Ingham county. At the junction of Red Cedar and Grand rivers, it is 87 m. N.W. of Detroit, and is served by the Michigan Central, New York Central, and other rlys. and an airport. The capitol, 1873, stands in a park of 11 acres on elevated ground, in a bend of the Grand river; here also is the state library of over 100,000 volumes. In the residential suburb of East Lansing is the oldest state agricultural college in the U.S.A. Manufactures include agricultural implements, motor vehicles, Diesel engines, pumps, furniture, silk, and woollen goods. Lansing was settled in 1837, chosen as the state capital in 1847, and became a city in 1859. Pop. 78,753.

Lansing, ROBERT (1864-1928). American politician. Born at Watertown, Oct. 17, 1864, he was educated at Amherst College. He became a barrister in 1889, and while practising at Watertown came into prominence as assistant counsel for the

U.S.A. in the Bering Sea arbitration, 1892-93. Appointments of a similar kind followed. In 1915 Wilson made Lansing his secretary of state, and it fell to him to advise on matters that preceded and followed the entry of the U.S.A. into the First Great War. He resigned in 1920. He was at one time associate editor of *The American Journal of International Law*, on which subject he was a recognized authority. His memoirs of the Versailles conference, *The Peace Negotiations*, appeared 1921. Lansing died Oct. 30, 1928.

Lansquenet. The name given during the late 15th and 16th centuries to the German mercenaries in France, the word being a Fr. corruption of Ger. *Landsknecht*. They were found fighting on both Catholic and Protestant sides in the wars of religion, usually as separate units under their own officers. See *Infantry*; *Mercenary*.

Lansquenet. A card game for several players. A full pack of 52 cards is used, or sometimes two packs shuffled together, for this species of banker game. The dealer being determined, he places the two top cards face upwards upon the table. These form the hand cards, and no bets can be made upon them. He then gives one faced card to himself, and one to each punter. If any card dealt is of the same denomination as either of the hand cards, it must be placed upon them. The banker continues to turn cards from the top of the pack so long as his own remains unpaired by one of a similar denomination. Should he draw a similar card to his own, the other players win all their stakes. But each time he pairs one of the players' cards, the banker appropriates all stakes upon that particular card. As each card is matched, the banker withdraws that pair. The name commemorates the German *Landsknechte*, who took the game into France.

Lantern (Fr. *lanterne*; Gr. *lampein*, to give light). Name given to a case for holding or carrying a light. This usually consists of a metal framework with windows of some transparent material; a big example is the light chamber of a lighthouse. In engineering, the word may be applied to any construction so shaped, e.g. a lantern pinion or trundle wheel. In electricity, that part of the case of a quadrant electrometer surrounding the mirror and suspension fibres is called the lantern. In archi-

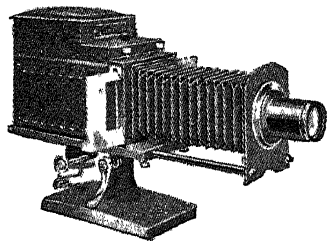


Robert Lansing,
American politician

ture lantern means an open-work structure of timber or stone, circular or polygonal, erected on the summit of a tower; or a glazed cage surmounting a dome or corridor, crowning the fabric and giving light to the interior. In medieval work a lantern is scarcely to be distinguished from a cupola. That on the octagonal tower of Ely Cathedral illustrates its ornate use.

CHINESE LANTERN. This is a collapsible candle lantern made of paper; also a popular name for the fruit of the Cape gooseberry (*q.v.*).

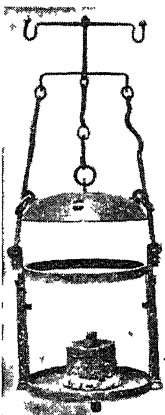
MAGIC LANTERN, OPTISCOPE, OR PROJECTION LANTERN. This is an optical instrument for projecting



Lantern. Projector of the so-called magic lantern, or optiscope

pictures on to a wall or screen. A metal light chamber holds the illuminant, usually an electric lamp of high candle power and special "projection" type. In one side of the chamber are condensing lenses which concentrate the light on the transparency to be projected; in alignment with the light source, condenser, and slide carrier is the projection lens which magnifies and brings the enlarged image into focus on the screen. Two main types of projector are in common use. The first takes the standard size photographic lantern plate $3\frac{1}{4}$ ins. sq.; the other projects sub-standard slides 2 ins. sq. and film frames 24×18 mm., 24×24 mm., and 24×36 mm., either mounted singly or as strips of cine-film 35 mm. wide and of various lengths.

LANTERN SLIDE. For projection on a screen by means of a magic

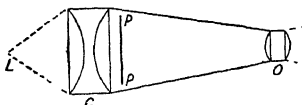


Lantern. Left, Roman bronze lantern. Right, octagonal lantern or open-work stone structure, on the tower of Ely cathedral

lantern, hand-drawn and painted slides are sometimes used, but the majority are positive prints from photographic negatives on lantern plates coated with a special emulsion and bound up with a protective cover glass. Film transparencies of standard size, either monochrome or direct colour photographs, are bound between two cover glasses; but in sub-standard sizes the films are frequently uncovered, single pictures being mounted in specially designed supporting frames. See Photography.

Lantern-fly (*Fulgoridae*). Tropical family of often large, brilliantly coloured insects belonging to the order Hemiptera (sub-order Homoptera). In many the head is prolonged into a huge hollow outgrowth which in some species was once believed to be luminous, hence the common name of lantern-fly. The great lantern-fly of Brazil, *Laternaria phosphorea*, has a wing-spread of nearly 6 ins.

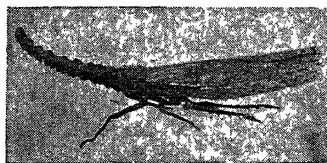
Lanthanum. One of the metallic elements known as rare earths. Mosander first isolated the metal in 1839 by fusion of the chloride with metallic potassium, but it is now obtained by electrolysis of a fused bath of lanthanum chloride. The element, symbol La, is the first of the rare earth group in the periodic table, with an atomic number of 57; atomic weight, 138.92; specific gravity 6.12; melting point 810° C.



Lantern. Diagram of a magic lantern projector: L, light source; C, double plane-convex condenser; PP, slide; O, projection lens

crystal structure, as alpha-lanthanum, close-packed hexagonal; as beta-lanthanum, face-centred cubic. The metal resembles iron in colour and lustre, but is attacked by moist air and rapidly decomposed by boiling water. It is a by-product in the extraction of cerium and thorium from monazite sand. In spite of attempts to use it as an alloying constituent, especially in aluminium, there has been no commercial demand for the metal. The oxide is used in ceramics and optical glasses and for weighting silks and rayon.

Lanyard. Plaited cord looped round the shoulder and under the shoulder strap of a military tunic or battle-dress blouse, the free end being in the breast-pocket. It was first worn by gunners of the Royal Artillery, and coloured white, the free end of the cord having attached to it the key with which shell-fuses are set. Nowadays lanyards are worn by all branches of the army, their colour depending upon the regimental or corps colours of the wearer. In most units they are restricted to those men who pass a section leader's course. In the Royal Navy a white lanyard is worn round the neck and has a knife attached. Before the introduction of case ammunition, a lanyard was attached to the friction tube of a



Lantern Fly. Specimen of *Fulgora nobilis*, a species found in Borneo

cannon, and on being pulled fired the priming of the main charge.

Lanuvium. Ancient city of Latium, Italy. It was situated on a spur of the Alban Hills about 20 m. S.E. of the Appian Way. It was noted for its temple to Juno, and was the birthplace of the emperor Antoninus Pius. On its site is the small town of Civit  Lavinia.

Lanza, GIOVANNI (1810-82). Italian statesman. Born at Vignale, Piedmont, Feb. 15, 1810, he became a doctor, but gave up his profession for politics. President of the chamber of deputies in 1860 and in 1867-68, he became premier in 1869, and was in office until 1873, when Rome was united to the kingdom of Italy, and made the capital. He died March 9, 1882.

Lanzarote. One of the larger Canary Islands. Of volcanic origin, it is the most easterly, and rises to

a central summit, Famara, of 2,050 ft. It yields the finest grapes and wine of the group. The capital is Arrecife, on the S.E. coast. Its area is 300 sq. m. Pop. 17,000.

Lao. Siamese name for a people of Tai stock in Indo-China. They number about 2,000,000 in Siam and 405,000 in Laos, with smaller offshoots in other parts of French Indo-China. Allied to the Shans, they descended the river valleys, driving into the uplands the aboriginal Kha. The Pong Dam, black-paunch, mostly in N. Siam, are usually tattooed from the waist downwards; the Pong Kao, white-paunch, mostly in Laos, do not tattoo. Lax Buddhists, with much spirit-worship influenced by Kha contact, they occupy huts, erected on 6-ft. piles, which enclose the domestic animals and weaving looms.

Laoag. Town of Luzon, Philippine Islands. The capital of the prov. of Ilocos Norte, it stands on the Laoag or Pagsan river, about 5 m. from the coast. Maize, sugar, cotton, and tobacco are exported. Pop. 40,800.

Laocoon (Greek *Laokoon*). In the Greek mythology, the Trojan priest who warned his countrymen



Laocöon. Famous sculpture found in 1506, now in the Vatican Museum, Rome. It is of late Hellenistic origin

of the Wooden Horse, the Greek stratagem which proved so disastrous to Troy. After his warning two serpents sent by Poseidon came up from the sea while Laocöon was sacrificing, and crushed the priest and his two sons to death. This incident is depicted in the famous piece of statuary discovered at Rome in 1506 and now in the Vatican. Three sculptors of Rhodes — Agesander, Polydorus, and Athenodorus — are credited with the work. *Pron.* Lay-ock-on.

Laocöon. The title of a famous treatise by Gotthold Ephraim Lessing (*q.v.*), published in 1766. Why, in the famous sculpture, is Laocöon's agony confined to his body, while Virgil, in *The Aeneid*, makes the victim utter a horrible shriek? Because, says Lessing, artist and poet had to work with different materials, the artist being limited to the laws of his art, the objective of which is beauty, and to the expression of a moment; the poet being free of the whole gamut of expression and the whole range of nature. Lessing's *Laocöon* is suggestive rather than exhaustive, and was left unfinished. It stimulated archaeological study, and its fundamental axioms regarding the boundaries between poetry and the plastic arts remain virtually unshaken.

Laodamia (Gr. *Laodameia*). In Greek mythology, wife of Protesilaus. When her husband had been killed at Troy, she asked the gods if he might return from Hades to converse with her for three hours. When Protesilaus went back to Hades, she died and went with him.

Laodicea ad Lycum. Ancient city of Phrygia, Asia Minor. It is on the Lycus, a tributary of the Maeander, a few miles W. of Colossae. Founded by Antiochus II, king of Syria, in 259 B.C., it became one of the most flourishing cities in Asia Minor, standing as it did on the highway to the E., and was noted for its textile manufactures. It was destroyed by an earthquake in the time of Nero, but was speedily rebuilt. It was an early seat of Christianity, and its church was one of the seven churches of Asia Minor.

Laodicea ad Mare. Ancient city of Syria. The modern Latakia, it was on the coast, about 50 m. S. of Antioch. It was founded, and named after his mother, by Seleucus I about 300 B.C., and became the chief port of Syria. *See* Latakia.

Laoighis. Inland co. of Eire, its name being officially written as Leix during 1922-35, and earlier as Queen's. In the prov. of Leinster, it has an area of 664 sq. m. The surface is generally flat or undulating, but in the N.W. are the Slieve Bloom Mts., and in the interior is much bogland. The chief rivers are the Barrow and the Nore. Agriculture is the main occupation, but a little coal is mined in the S.E. The Eire state rlys. and the Grand canal serve the co. Portlaoighise (Maryborough) is the co. town; other places are Mountmellick, Portar-

lington, Abbeyleix, and Stradally. The most notable secular ruin is that of the castle on the rock of Dunamase, near Portlaoighise.

The district, which in 1556 was made a co. and named after the queen of England, was before that time covered by the districts of Leix and Ossory. It had a number of religious houses, including those at Timahoe, Aghaboe, and Abbeyleix, while Aghaboe was also the seat of a bishop. The principal families were the O'Mores in Leix and the Fitzpatrick in Ossory. The area was invaded by the English, but they did not take possession of it until the 16th century. In 1920 Laoighis was united electorally to the adjoining Offaly (King's) and since 1935 has returned five members to the Dáil. The 1946 pop. was 49,634; a dramatic decrease from the peak (1841) census of 153,930. *Pron.* Loesh

Laomedon. In Greek mythology, a king of Troy. The gods Poseidon and Apollo, having offended Zeus, were condemned to give their services to Laomedon. Poseidon built the famous walls of the city, and Apollo tended the king's flocks on Mt. Ida. When the period of service had ended, the two gods claimed from Laomedon the reward he had promised. Laomedon refused to redeem his promise, and in revenge Poseidon sent a sea-monster to ravage the neighbourhood of Troy, to which a maiden had to be sacrificed from time to time. How Hesione, the king's daughter, was saved by Hercules, who killed the monster, is related under the entry Hesione. Laomedon had promised a team of beautiful horses to Hercules if he should save his daughter, but a second time the king proved faithless, and Hercules, in his wrath, led an expedition against Troy and killed Laomedon and all his sons, except Priam, who became king. *Pron.* La-ommed-on.

Laon. Town of France, capital of the dept. of Aisne. It lies 87 m. by rly. N.E. of Paris, the town



Laon arms

occupying a steep ridge rising to about 330 ft. above the surrounding plain, some suburbs and the rly. station lying at the foot of the hill. Owing to its position on hilly ground, Laon

has always been of strategic value, and has a fortress of

importance, with forts on the hill and the plain, but its trade and small industries are of little account.

The cathedral of Notre Dame, until 1789 the seat of a bishop, is a fine example of Gothic architecture, with a splendid W. façade and five impressive towers; it dates chiefly from the 12th–14th centuries, has notable rose windows, and its commanding position makes it conspicuous. The palais de justice was the episcopal palace, built in the 13th century. Pop. 17,401.

Laon was a Roman station called Laudunum, and was naturally a stronghold in medieval times. Its bishopric was founded in the 5th century. It was garrisoned by the English during 1410–29, and captured by Henry of Navarre in 1594. The scene of French defeats in 1814 and 1815, it was taken by the Prussians in 1870, when a powder magazine was blown up by a French private soldier as the enemy reached the citadel.

In the First Great War the fortress was captured by Von Kluck on Aug. 30, 1914, and the town remained in German hands until regained by the French 10th army under Mangin in one of the final offensives of the Allies, Oct. 13, 1918. Much damage from bombs was suffered during the Second Great War: the Hôtel Dieu, prefecture, and S. Martin's church were almost destroyed,



Lao-tse, Chinese philosopher
From a Chinese print

the Porte d'Ardon was badly hit, and the cathedral and palais de justice were superficially damaged.

Laon and Cythra. Original title of a poem by Shelley, later entitled *The Revolt of Islam* (g.v.).

Laos. Autonomous kingdom of Indo-China, an associated state of the French Union. Bounded on the N.W. by China, N.E. and E. by Vietnam, S. by Cambodia, and W. by Siam and Burma, it has an area of 89,320 sq. m. It is divided into 11 provinces. The principal crops are rice, tea, citrus fruits, gum, benzoin, china-grass, and cinchona; and the northern forests produce valuable timber, especially teak. Two tin mines

are worked. There are 20 aerodromes and a network of main roads for all seasons.

Laos has administrative autonomy, the federation of Indo-China being represented by a commissar of the republic. It was first governed by the French in 1893. As part of the Indo-Chinese nationalist movement which opposed the Vichy French administration, guerrilla warfare broke out in March, 1945, and continued for a year before the withdrawal of the Chinese army which had occupied Laos at the end of the Second Great War. By agreement with France, N. and S. Laos were

amalgamated as a single state, 1946, and Laos became an associated state of the French Union, 1950. Pop. est. 1,500,000 (Buddhists).

Lao-tse. Chinese philosopher. His birth, on slender authority, is assigned to the year 604 or 570 B.C. Certain Chinese historians state that he was born near the modern Kwei-te in the province of Honan. His real name was Erh Li, and he is said to have been librarian to an emperor of the Chou dynasty. At an advanced age he left the city of Chow and for ever disappeared after passing through the N. gate of the province. Contemporary and opponent of Confucius (whom he is reputed to have met in 517), he is commemorated by the religion of Taoism. The sacred book *Tao-teh-king* (the canon of reason and virtue) on which it is based was possibly not written by Lao-tse, though he was its inspirer. He believed in transmigration of souls and, like Pythagoras, claimed to have inhabited the bodies of different men and animals. See *Taoism*. Consult *The Way of Life According to Lao-tse*, trs. W. Bynner, 1947.

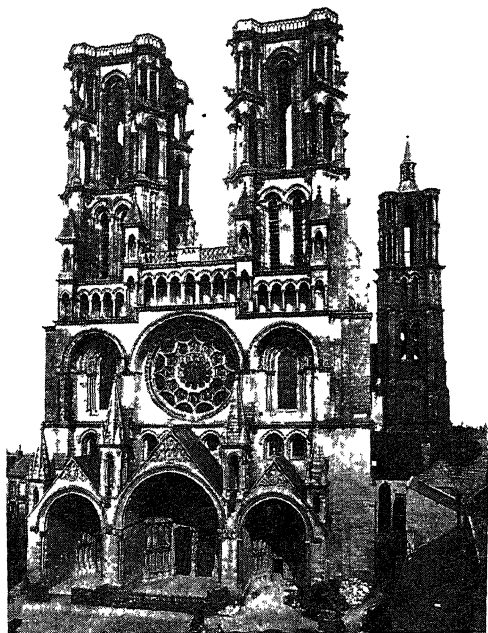
Lapageria Rosea. Climbing shrub of the family Liliaceae. It is a native of Chile. It has alter-



Lapageria Rosea. Leaves and flowers of this Chilean climber

nate, lance-shaped, leathery leaves, and large, drooping, rosy-crimson flowers, which are produced in abundance for several months.

La Pallice. Seaport of France, in Charente-Inférieure, 3 m. W.S.W. of La Rochelle, opposite the E. extremity of the island of Ré. It is accessible to ships up to 20 ft. draught. The German battleship *Scharnhorst* took refuge there June 22, 1941, and was repeatedly bombed by the Allies. La Pallice was developed because of the inability of the largest ships to dock at La Rochelle (g.v.), and has regular communication with N. and S. America, England, W. Africa, Egypt, and the Far East,



Laon, France. Façade of the Gothic cathedral of Notre Dame; it dates mostly from the 12th to the 14th centuries

La Palma. Town of Colombia, in the prov. of Cundinamarca. It stands near the Rio Negro, 40 m. W. by S. of Tunja. There are gold and copper mines in the vicinity and extensive coffee plantations.

La Paz (Sp., peace). River port and town of Argentina, in the prov. of Entre Rios. It stands on the river Paraná, 87 m. N.N.E. of Paraná city. A port of transit between Asunción and Buenos Aires, 530 m. by the river, it exports preserved beef and animal products. Founded in 1836, it has an est. pop. of 15,000.

La Paz. Department of Bolivia, S. America. It is bounded on the W. by Peru and Lake Titicaca (*q.v.*); N. by Pando, E. by El Beni and Cochabamba, S. by Oruro, depts. Traversed by the Cordillera Real of the Andes, it contains the highest land in Bolivia and some of the loftiest peaks in the whole continent. (See Illimani; Sorata.) To the N. is a dry, hot plateau, peopled by Indians; to the E. lies a plain, watered by affluents of the Beni and Purus. The dept. produces gold, silver, copper, bismuth, and tin, besides cereals, coffee, cocoa, sugar, tobacco, bananas, etc. The capital is La Paz. Area 43,976 sq. m. Pop. est. 1,173,300.

La Paz. Largest town and commercial capital of Bolivia, S. America. It stands in the centre of La Paz dept., of which also it is the capital, and is connected with the Pacific coast at Mollendo by the Peruvian rail and steamer route via Lake Titicaca, and with Arica and Antofagasta in Chile. At an alt. of 12,450 ft., it is the loftiest capital in the world and enjoys a healthy climate. It has a cathedral (the seat of an archbishop), legislative and government palaces, a university, library,

colleges, museum, and hospitals. Electric trams and buses serve the city. Founded in 1548 as Nuestra Señora de la Paz (Our Lady of Peace), it was renamed Paz de Ayacucho to commemorate the victory of the Bolivians over the Spaniards. Pop. est. 301,000, 30 p.c. Indians.

La Paz. Capital of the province of the same name in Honduras. In the fertile Comayagua valley, it is one of the oldest towns and the centre of agricultural and mining industries. Pop. 3,600.

La Paz. Harbour and capital of Lower California South, Mexico. It stands on the E. coast, on the Bay of La Paz, Gulf of California. There are no rlys. in the peninsula of Lower California, and the nearest line to La Paz is across the gulf, here 120 m. wide, at Topolobampo in Sinaloa prov. The district supports agriculture and gold and silver mining, but the chief industry is pearl fishing; one company employs 1,000 men and the annual value of pearl output is some \$3,000,000 and of shells \$2,000,000 in U.S. currency.

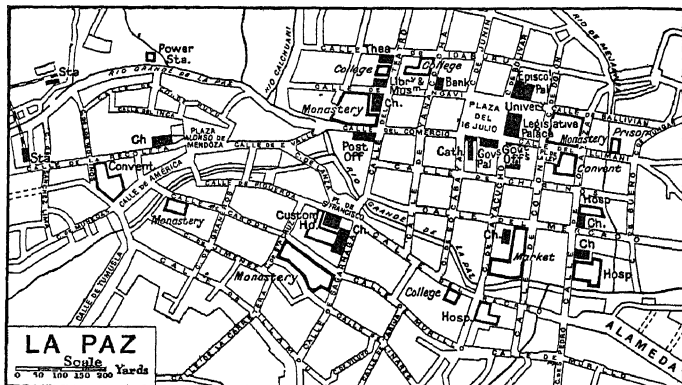
La Pérouse. Name of an island group, mt., and strait. The island

group, sometimes known as Santa Cruz islands, from the largest, lies between the Solomons and the New Hebrides in the Pacific Ocean. Here the celebrated French navigator La Pérouse (*v.i.*) is believed to have perished in 1788. The mt. is a peak in the St. Elias range in Canada, near the Alaskan border, having a height of 10,758 ft. The strait separates the Japanese islands of Hokkaido and Honshu; it is also known as Tsugaru Strait.

La Pérouse, JEAN FRANÇOIS DE GALAUP, COMTE DE (1741-88). French sailor. Born at Guo, near Albi, Aug. 22, 1741, he entered the French navy and was wounded and taken prisoner at the battle of Belle Isle, 1759. In 1782 he was entrusted with the task of destroying the English forts in Hudson's Bay, but displayed notable gallantry towards the garrisons. In command of the frigates Boussole and



Comte de la Pérouse,
French sailor



La Paz, Bolivia. General view of the commercial capital of the S. American republic; a street plan of the city is also shown

Astrolabe, he set out from Brest, Aug. 1, 1785, on a voyage round the world. He doubled Cape Horn, explored the coast of California, and, crossing to China, reached Macao in 1787. He explored the shores of Tartary and Kamchatka, and from Avatcha sent an officer with his journals overland to Paris. Capt. de Langle, of the Astrolabe, and 11 of his companions were killed by natives of the Navigators' Islands.

La Pérouse reached Botany Bay, by way of the Friendly Islands and Norfolk Island, Jan., 1788, sent his last letter thence to Paris, and was not heard of again until in 1826 an English captain, Peter Dillon, discovered the wreck of

the two French ships on a coral reef off Vanikoro, N. of the New Hebrides. Part of his journals were published under the title, *Voyage autour du Monde*, 1797. *Pron.* Payrooz.

Lapilli (Latin, little stones). Small fragments of lava thrown out from volcanoes during eruption. The term is restricted to pieces in size between a pea and a walnut, larger objects being referred to as bombs.

Lapis Lazuli. This mineral is also known as lazurite (*q.v.*).

Lapithae. In Greek mythology, people of Thessaly ruled over by Peirithous, the friend of Theseus. They are known for their battle with the Centaurs. *See* Centaur; Peirithous.

Laplace, PIERRE SIMON, MARQUIS OF (1749-1827). A French astronomer. Born at Beaumont-en-Auge on

March 28, 1749, a farmer's son, he attracted the attention of d'Alembert, who obtained for him the chair of mathematics at the École Militaire. Remarkable ability was early shown by the publication, 1766-69, of his researches on the integral calculus; there followed papers on the theory of probability which stamped him as a man of genius. In 1773 he was appointed an associate, and in 1785 a member of the Academy of Sciences, and in 1794 became professor of analysis at the École Normale.

The masterly *Exposition du Système du Monde*, 1796, as lucid as it is scholarly, was more than anything the cause of his election to the Academy in 1816. A more comprehensive work is *Mécanique Céleste*, 5 vols., 1799-1825, the greatest contribution to the mathematics of astronomy since Newton's *Principia*. Laplace knew prosperity and honour in his lifetime; he was made a count by Napoleon and a marquis by Louis XVIII. As a man, his stature was lessened by egoism and political servility, but he was the greatest astronomer France has produced and has been called the French Newton. He died at Arcueil, March 5, 1827.

His famous nebular hypothesis, his mathematical researches into the inequalities of the motions of Jupiter and Saturn, also of the motions of the moon and the tides, and into the equilibrium of

the solar system have given him enduring fame, and show a profound power of analysis which has seldom been equalled. In physics he contributed papers on capillary action, the equilibrium of a rotating fluid mass, and the theory of sound, which added greatly to his reputation. The differential equation known by his name forms the basis of all researches on attractions, and is one of the most important equations in physics.

Bibliography. *Oeuvres Complètes*, 14 vols. 1878-1912; Eng. trans., *The System of the World*, J. Pond, 1809; H. Harte, 1830; *Treatise upon Analytical Mechanics*, J. Toplis, 1814; *Philosophical Essay on Probabilities*, F. W. Truscott and F. L. Emory, 1902; *Biographies of Scientific Men*, D. F. J. Arago, 1857; *Elementary Treatise on Laplace's Functions*, I. Todhunter, 1875; *The Laplace Transform*, D. V. Widder, 1942.

Lapland. The homeland of the Lapps, an undefined district in the N.W. of Europe. It extends W. from the White Sea to the Atlantic Coast in the N. of Scandinavia, and includes parts of the U.S.S.R., Finland, Sweden, and Norway. In the W. it consists of the barren plateau and moorland of Norway with a narrow fjord coastland; E. of this is the lake-dotted lowland of Sweden and N. Finland, with countless rivers; then comes the low Murman coast on the Arctic Ocean. Lapland is the name of a dept. in Finland, with area 36,308 sq. m. and pop. 143,679.

The true Lapps are of Finno-Ugrian stock and speech. They number possibly 20,000 in Norway; 7,000 in Sweden; 2,000 each in Finland and in the U.S.S.R. During the Second Great War most of the Norwegian Lapps were removed to Sweden and S.

Finland, their principal town, Ivola, having been destroyed by the Germans, and the rest of their settlements heavily damaged; they returned to Norway towards the close of 1945, and with government help began to build improved settlements. There is a flourishing colony in Alaska.

A short, ungainly, brown-haired, flat-faced, yellowish-white, round-headed people, those in Scandinavia are reindeer-nomads, with some coast and riverside fishing and cattle-breeding settlements; those on the Kola peninsula are an inferior fishing community. A veneer of Lutheran or orthodox Christianity overlies their Siberian shamanism, reverence for the bear, and drum-divination.

Bibliography. *Northern Travel*, B. Taylor, 1858; *Land of the Midnight Sun*, P. B. du Chaillu, 1881; *Lapland Journey*, H. Sutherland, 1939; *Lapland*, H. A. Bernatzik, 1940.

La Plata, RIO DE, OR RIVER PLATE (Sp., Silver river). Great estuary of S. America. Between Uruguay on the N.E. and Argentina on the S.W., it is formed by the union of the Uruguay and Paraná rivers. It is 200 m. long by 145 m. wide at its mouth. The N. shore is steep, the S. low, with sandbanks, the only good natural harbour being that of Montevideo. Its affluents drain an area estimated at 1,400,000 sq. m.; and its muddy stream is noticeable from 70 m. to 80 m. out to sea. The estuary is continually silting up, involving constant dredging, while its shoals and currents render its navigation dangerous. It was discovered about 1515 by Diaz de Solis. The Anglo-German naval battle of 1939 is described as Plate, Battle of the River.



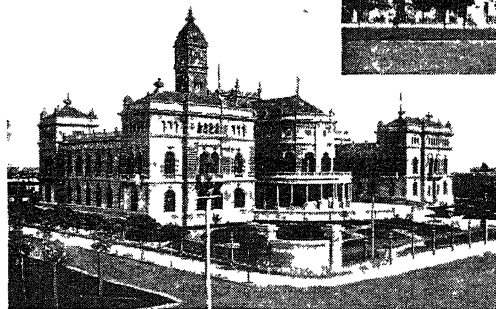
Marquis de Laplace, French astronomer



Lapland. Family group of Lapps from Norway at the door of their turf-covered winter hut

La Plata. City of Argentina and capital of the prov. of Buenos Aires. It is 35 m. by electric and steam rly. S.E. of Buenos Aires and 5 m. by rly. and canal from Ensenada, its port on the Rio de la Plata. Founded in 1882, it is the model city of Argentina, with splendid avenues and public buildings, a cathedral, a university, an observatory and many parks. There are iron foundries, meat

church living to appoint on a vacancy. At the end of six months the right of presentation lapses, and falls to the bishop.



La Plata, Argentina. Government buildings (top) and municipal offices (below) in this well-planned city

packing plants, and petroleum refineries. Two miles of quays, where grain and meat products are exported, can take the largest vessels. Pop. est. 253,000.

La Porte. A city of Indiana, U.S.A., the co. seat of La Porte county. A summer resort in a picturesque lake district, it is 60 m. S.E. of Chicago, and is served by the Lake Shore and Michigan Southern and other rlys. The industrial plants include foundries, machine shops, saw mills, furniture, woollen, and piano factories. La Porte was settled in 1830, and became a city in 1852. Pop. 16,180.

Lapp Drum. Instrument formerly used in divination by the priests of the Lapp religion. It was believed that by its use spirits could be bound, the future foretold, the sick healed, and enemies afflicted with evils. Since the 17th cent. it has been forbidden.

Lapse (Lat. *lapsus*, a slip). Term used in English law. When a person to whom a gift has been made by will dies before the testator, the gift lapses, i.e. fails to take effect. But a gift to a child or other issue of the testator will not lapse on the death of the beneficiary leaving issue. It does not necessarily go to the issue of the deceased beneficiary, but passes under his will or according to the rules of intestacy as if he had died immediately after the testator.

The word lapse also applies to the failure of the patron of a

states were acquired under this law. Childless princes sought to avoid a lapse by adopting an heir, but the British authorities frequently refused to recognize these adoptions. Lord Dalhousie is known for the extent to which he made use of this doctrine of lapse. See India.

Lapse. Term which denotes the decrease in temperature of the air with increase of height above the ground. The lapse rate, taken as positive, is the fall of temperature in unit height; and under average conditions the mean value in the lower atmosphere is about 3° F. per 1,000 ft. Negative lapse, i.e. increase of temperature with height, is termed inversion.

Lapwing (A.S. *hlæpewince*, reeling in flight). Common British bird, *Vanellus vanellus*, one of the



Lapwing. The green plover, a bird that nests on the ground

plovers, often known as the peewit from its call-note. The back and crest are dark green, the throat black, and the cheeks and underparts white. The bird is found in most parts of the country, especially in marshy districts, where it feeds upon snails, insects, and worms. The eggs are laid on the bare ground, which they closely resemble in colour. The taking of green plovers' eggs is forbidden by law, and the "plovers' eggs" of the market are those of the black-headed gull.

La Quiaca. A town of Argentina, in Jujuy prov. On the Bolivian-Argentine border, it is the terminus of the Central Northern Argentine rly., whence connexion can be made via Atocha with the Bolivian rly. system. It serves as the chief distributing centre for Bolivia. Pop. 4,000.

Lara. Inland state of N.W. Venezuela. It is bounded on the N. by Falcon and on the S. by Portuguesa. It is largely mountainous, and traversed in the N. by the rly. to Tucacas on the coast. The capital is Barquisimeto (*q.v.*). Area, 7,642 sq. m. Pop. 332,975.

Larache OR EL ARISH. Seaport of Morocco. On the Atlantic coast, it is in the Spanish zone. There is a rly. to Kasr-el-Kebir, 25 m. S.E., and a cable to Cadiz. Here is a school of the Alliance Israélite. Pop. 36,132.

Laramie. River, mountains, peak, plains, and town of the U.S.A., in the Rocky Mts. The plains lie E. of the N. Platte river in Wyoming, S. of its great bend round the mountains which form the E. edge of the plains. The peak (9,020 ft. high), the highest point in the range, is situated far to the E., overlooking the N. Platte.

The river (200 m. long) rises in Long's Peak in the Medicine Bow range in Colorado, flows N. into Wyoming, passes Laramie town (pop. 10,627), seat of the univ. of Wyoming, and drains the upper portion of the plains. It then bends to the N.E. round Iron Mt., and flows S.E. of the peak to the N. Platte at Fort Laramie. The Union Pacific rly. W. of Cheyenne follows the upper course of the river N. from Laramie, and turns due W. at Medicine Bow across the plains and the N. Platte.

Laramie Beds. In geology the name given to a series of sediments found in Western N.

America. They are an intermediate or a transition state between the marine deposits of the Cretaceous and the fresh-water strata of the Tertiary periods. Fossils found in Laramie beds include both fresh and sea-water molluscs, plesiosaurs, etc.

Larbert. Town and parish of Stirlingshire, Scotland. On the Carron, 2½ m. W.N.W. of Falkirk. It is well served by main line railways. There are coalmines, ironworks, and sawmills in the neighbourhood. The chief building is the parish church, and near are the remains of Torwood Castle. Pop. 13,029. The district around was formerly called Torwood Forest, and in it Wallace took refuge in 1298.

Larboard. Obsolete naval term for the port or left-hand side of a ship, looking forward. It was officially abolished to avoid the confusion in sound with starboard.

Larceny (Lat. *latrocinium*, robbery). Term used in English law to describe one kind of theft. To "steal, take and carry away" the goods of another, with intent to deprive the owner of his property in them, is larceny. Unless there is an actual carrying away there is no larceny; but a slight *asportation*, as it is called, will suffice. Thus, to pull a handkerchief partly out of a pocket; to carry a clock from the mantelpiece to a table, for convenience of packing—these and such acts are enough.

There are several forms of larceny: (1) Simple larceny or common theft; (2) larceny in a dwelling-house—the same as house-breaking but where there is no breaking and entering; (3) larceny as a bailee—where a person entrusted with the property of another appropriates it for himself; (4) larceny from the person, which if accompanied by violence is called robbery. Larceny is a felony. The punishment varies. There is a maximum of five years' penal servitude for simple larceny and 14 years for larceny in a dwelling-house. At common law only personal property was the subject of larceny; consequently growing crops, which were real property, could not be stolen. A dog could not be stolen, because capital punishment, which then applied to larceny, was thought too severe. These technical defects have been remedied by parliament. See Theft.

Larch (*Larix europaea*). Lofty pyramidal tree belonging to the family Coniferae. It is a native of Europe, where its home is chiefly in the central Alps. Its branches

spread with a downward sweep on all sides and give it a graceful symmetry. The needle-like leaves are disposed in bundles, and are completely shed on the approach of winter, so that the tree is both coniferous and deciduous. As its growth is rapid, it may attain a height of 100 ft., with a straight, tapering trunk, clothed with longitudinally furrowed brown bark. The long twigs which bear the flowers and cones hang vertically, while the short, loose, oval cones stand upright. In the early condition of these, when they are yet flowers, the scales are of a red purple and translucent. In a plantation of larches the beauty of form has no room for development, but more timber is produced.

Larch enjoys best a moist, well drained soil in which loam and lime predominate, preferably on a hillside situation. The timber is not of profitable value until the tree has attained the age of about 20 years, and is largely used for pitprops, poles, and on rlys. See Timber.

Lard. Fat of the pig, that has been strained of all connective tissue by a melting process. White and of butter-like consistency, it varies in quality, the best being obtained from the fat surrounding the kidneys and stomach of the animal. Of great value in cookery, lard is also employed in pharmacy to form the basis of various ointments. An oil is extracted from it and used as a lubricant. It melts at 40° C. to a clear liquid.

Lardner, DIONYSIUS (1793–1859). A British scientific writer and lecturer. Born in Dublin, on April 3, 1793, and educated at Trinity College, he took holy orders, but devoted himself to scientific and literary work. Appointed professor of natural philosophy and astronomy at University College, London, 1827, he founded and edited Lardner's Cabinet Cyclopaedia, and other works of a similar character. He died at Naples, April 29, 1859.

Laredo. City of Texas, U.S.A., the co. seat of Webb co. A port of entry on the Rio Grande, opposite and connected by bridge with the Mexican Nuevo Laredo (with which until 1847, after the U.S.-Mexican war, it formed one town),

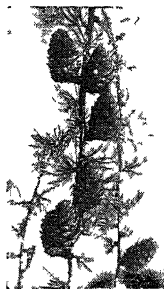
it is 155 m. S.W. of San Antonio, is served by rly., and is on the Pan-American Highway. More than 50 p.c. of overland trade between the U.S.A. and Mexico passes through Laredo, which carries on a large trade in agricultural produce from the irrigated lands of the vicinity. Industrial establishments include one of the few antimony-smelting plants in the Americas. Settled by the Spanish 1755, it became a municipality of Texas in 1848, a city 1852. Pop. 39,274.

Lares (old form, *lases*). In Roman mythology, originally divinities who watched over agricultural pursuits. They were worshipped at the *compita* (cross roads), where a festival was held in their honour at the beginning of the year. Each household also had a private lar or household god (afterwards two), whose special function it was to prevent the family from dying out, and to whom various offerings were made three times a month and on special occasions. An image of the lar was kept on the hearth or in the *lararium*, a kind of chapel set apart for the purpose. Lares were also tutelary deities of travellers, seafarers, soldiers, streets and districts, and entire towns and cities. After the battle of Actium, Augustus ordered the image of his genius (*g.v.*) to be set up between those of the lares in the chapels. The lares were originally distinct from the penates (*g.v.*), but were afterwards identified with them. They were represented wearing the chlamys and carrying a lance, with a dog at their feet. See Rome. *Pron.* in two syllables.

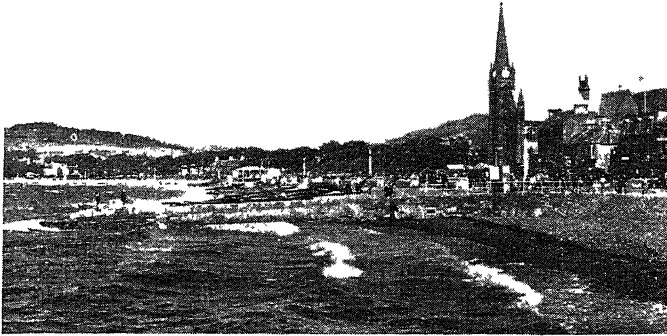
Largo. Italian musical term, meaning dignified, and broad in style. The great composers, *e.g.* Handel, Haydn, and Beethoven, have used it especially for slow movements of an intensely expressive character.

Largo. Name of two villages of Fife, Scotland. Known as Upper and Lower, they are situated on Largo Bay, 3 m. N.E. of Leven, and have a railway station. Alexander Selkirk (*q.v.*) to whom there is a statue, was born at Lower Largo. The principal industry is fishing, and the places attract visitors in the summer. Near is Largo Law, a hill 960 ft. high. Largo Bay is about 6 m. across and penetrates inland for 2 m. Pop., parish, 2,300.

Largs. Holiday resort of Ayrshire, Scotland. Standing on Largs Bay, an opening of the Firth of Clyde, 11 m. S.S.W. of Greenock,



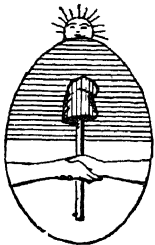
Larch. Cones and foliage



Largs, Ayrshire. Sea front of this Scottish market town and watering-place ; the spire is that of the parish church

it is the terminus of a branch rly. There is a harbour and a little shipping. The chief buildings are the parish church, hospital, institute, etc. An aisle of the old parish church still stands and has been turned into a mausoleum. There is good bathing and facilities for yachting and golf. The town is famous for the battle fought here in 1263 between the Scots and the Norwegians, Haakon of Norway being defeated by Alexander III; in 1772 human remains, supposed to be those of the fallen, were discovered here. Near the town are the old castles of Fairlie, Skelmorlie, and Knock, also Kelburn Castle, a seat of the earl of Glasgow. Pop. 7,340.

La Rioja. Province of N.W. Argentina. It is bounded on the W. by Chile and the Andes and else-



La Rioja arms

where by the provs. of San Juan, San Luis, Cordoba, and Catamarca. Mountainous in the W., it contains the Nevado de Famatina. The vine flourishes on the mountain slopes, where cereals are also

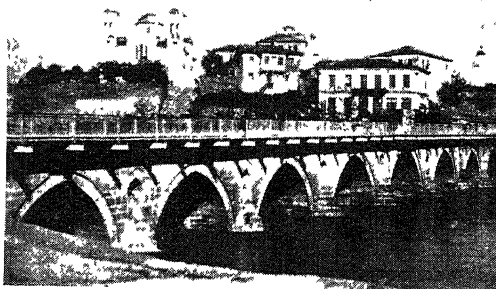
grown. The prov. has gold and is rich in copper, silver, sulphur, coal, graphite, and salt. Area, 33,394 sq. m. Pop. 109,386

The capital, La Rioja, stands on the S.E. slope of the Sierra de Velasco, at an alt. of 1,650 ft. There is rly. communication with Rosario and Buenos Aires. It exports wine, brandy, and oranges. Pop. 15,000.

La Rioja. Fertile region of N. Spain, in the N.W. section of the prov. of Logroño. An undulating plain, sloping from the highlands to the Ebro, it stretches in a S.E.

direction, following the Ebro from Haro to beyond Logroño, and is watered by the rivers Oja, Najerilla, and Iregua. A choice wine, named after the region, is produced from the vineyards which cover most of the hilly slopes.

Larissa. Name of six ancient cities of Europe and Asia. The chief is Larissa in Greece, called in Turkish Yeni Shehr, or new town. It stands on the river Salambria, 20 m. W. of the coast on the Gulf of Salonica and about 36 m. by rly. N.W. of Volo. Among the manufactures are silk, cotton, and tobacco. The surrounding district or nome bears the same name, being part of Thessaly, and grows grain which is marketed in the town. An important city in ancient times, Larissa was the seat of the council of Thessaly under the Roman Empire. Its prosperity continued until the late Middle Ages. It was ceded by Turkey to Greece in 1881 and was occupied by the Turks during the war of 1897. In the Second Great War it was heavily bombed by the Italians, and occupied by the Germans on April 21, 1941, when Australian troops, who had been isolated, fought their way through the streets to their own lines. On Oct. 26, 1944, Larissa was recovered by Greek patriot



Larissa, Greece. Bridge over the river Salambria. The town suffered much damage in the Second Great War

forces. Pop., city, 23,899 ; nome, 312,272.

Laristan. Province of Persia. It covers about 22,000 sq. m. along the Persian Gulf between Fars and Kerman provs., and is an arid sandy waste. The capital is Lar, while Bandar Abbas and Hormuz are other places.

Larivey OR LARRIVEY, PIERRE (c. 1540-1612). French cleric and playwright. He was born at Troyes, son of a member of an Italian publishing family, the Giunti, who, settling in France, translated his name into L'Arrivé. Pierre became a canon of Troyes, but is best remembered by his prose comedies of intrigue, introducing a natural dialogue, and drawn from Italian and classical sources which influenced Molière. Of his 12 plays 9 are extant, *Le Laquais*, *La Veuve*, *Les Esprits*, *Le Morfondu*, *Les Jaloux*, *Les Escoliers*, *La Constance*, *Le Fidèle*, *Les Tromperies*. He also translated Straparola's *Nights*.

Lark (*Alaudidae*). Name given to a large family of small birds, including about a hundred species, most of which occur in the E. hemisphere. Nine species are included among the birds of Great Britain, but only two breed here. The skylark is the best known and is found throughout the country. The woodlark is widely distributed but local. It closely resembles the skylark but is smaller. The short-toed lark occurs occasionally in the autumn, as do the crested lark and the white-winged lark. The shore lark is a regular autumn migrant to Great Britain and is usually found about the coast ; while the calandra lark, which inhabits the countries bordering the Mediterranean, is a rare visitor in the autumn. A characteristic feature of all larks is the long, straight claw on the hind toe, and long, pointed wings. Larks are protected under the Wild Bird Protection acts. See Bird; Skylark.

Lark. A river of England. It rises in S.W. Suffolk, and flows N., then N.W. to join the Great Ouse a few miles above Littleport in Cambridgeshire. Its length is 26 m., and the chief places on its banks are the old market town of Mildenhall and the city of Bury St. Edmunds.

Larkana. District and town of Pakistan, in Sind province. The town is situated 145 m. N. of Hyderabad and 7 m. W. of the Indus. It contains an ancient fort, now a hospital and gaol, and the tomb of Shah Baharah, and adjoins the Ghar canal. Called the Garden of Sind, the area yields three crops annually. The dist. extends N. of Karachi dist., and includes a sandy area with a scanty rainfall, between the Indus and the Baluchistan border. Only a quarter of the area is tilled, and this cultivation depends almost wholly upon irrigation from the Indus; rice and wheat are the chief crops. The eastern section along the river forms one of the most fertile areas in Sind, and the town is a noted grain market. The area of the district is 2,857 sq. m.; the pop. 511,208. with 80 p.c. Mahomedans. Pop., town, 28,000.

Larkhall. A town of Lanarkshire, Scotland. It stands on a plateau between the rivers Clyde and Avon; it has two railway stations, and lies 14 m. S.E. of Glasgow on the main Carlisle road which divides the town. The industries are concerned with textiles, bleaching, electrical appliances, light castings, also fruit growing in the surrounding district. Pop. 14,974.

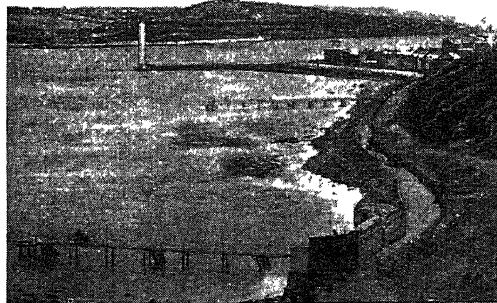
Larkhill. Camp on Salisbury Plain, Wiltshire, England. This houses the school of artillery and other military units. In 1912 the first British military aeroplane trials were held at Larkhill, where there was already a flying school. After the First Great War it was the R.A.F. kite balloon centre.

Larkin, JAMES (d. 1947). Irish labour leader. Organizer of the Irish Transport and General Workers' Union, of which he was secretary until 1923, he was elected to the Dublin corporation in 1912 and organized a transport strike there. In 1915 he went to the U.S.A., where in 1920 he was convicted of criminal anarchy. Released in 1923, he returned to Ireland, seized the headquarters of the Transport Union, and declared himself dictator. He then formed a new union and led many strikes and conflicts between the rival unions. He represented the Irish Free State at the Third International in Moscow, 1924. Elected to the Dáil in 1927, he refused to take his seat; at the 1928 and 1933 elections he was defeated. He died Jan. 30, 1947.

His son James became chairman of the Irish Labour party and represented Dublin W. in the Dáil.

Larkspur. A genus of annual and perennial herbs of the family Ranunculaceae, the Latin name being delphinium. The common European species (*D. ajacis*), to which the name larkspur properly belongs, is an annual, with the leaves divided into many thread-like segments, and having erect sprays of blue, pink, or white flowers. The most magnificent plants, six feet high, are mostly varieties or hybrids of *D. exaltatum*, a N. American perennial species. See Delphinium.

Larmor, SIR JOSEPH (1857–1942). A British scientist. Born at Magheragall, co. Antrim, July 11,



Larnie, Ireland. Harbour mouth and Memorial Tower to James Chaine, a local benefactor
Lawrence

1857, he was educated at Belfast and passed from Queen's College there to S. John's, Cambridge. In 1880 he was made professor of natural philosophy in Queen's College, Galway, but in 1885 returned to Cambridge as lecturer. From 1903 to 1932 he was Lucasian professor of mathematics there, and his work as a mathematician brought him a fellowship of the Royal Society, of which he was secretary 1901–12. The Larmor effect of a magnetic field upon an atom was first noted by this scientist. In 1909 Larmor was knighted, and in 1911–22 was M.P. for the university. He wrote *Aether and Matter*, 1900, and vols. of scientific memoirs, 1927–29. He died May 19, 1942.

Larnaka OR LARNACA (Lat. *Citium*; Gr. *Kition*). City and the chief seaport of Cyprus. It stands on the S. coast, 27 m. S.E. of Nicosia. There is good anchorage in the roadstead and facilities for discharging cargo. Grain, cotton, and fruit are exported. Citium was a Phoenician settlement, but received Greek colonists from 900 B.C. It is probably the Chittim or Kittim of the Bible, and many inscriptions and tombs have been

found. Zeno, founder of the Stoic school, was a native. Pop. 14,746.

Larne. Seaport, market town, and urban dist. of Antrim, N. Ireland. It is 24 m. N. of Belfast, with a rly. station, and stands at the entrance to Lough Larne. There is a good harbour, 1½ m. from the town, from which there is a regular steamship service of 35 m. to Stranraer, Scotland, and Glasgow, Liverpool, Dublin, and Londonderry. Larne, visited for bathing has a marine



Larne arms

biological station. The chief manufactures are linen, paper, and flour. The old name of the town was Inver. It was a flourishing port before the rise of Belfast, reviving, after a period of decay, when it became a steamship terminus in the 19th cent. Lough Larne is about 6 m. long and 1 m. wide. Market day, Wed. Pop. 11,090.

La Rochefoucauld, FRANÇOIS, DUC DE (1613–80). French author. Born in Paris, Sept. 15, 1613, of one of the oldest French noble families, he joined the army at 16. An admirer of Cardinals de Retz and Mazarin, he engaged in the Fronde plots, and was severely wounded at the siege of Paris, and again in the fight outside the Faubourg St. Antoine, 1652. After staying awhile in the country he returned and became a leading figure in the salons of the capital.



Duc de la Rochefoucauld, French author

In 1665 he published anonymously his *Reflexions ou Sentences et Maximes Morales*, known as *Maxims*. The book has been widely translated (e.g. Eng. trans. G. H. Powell, 1903). It gained for the author the distinction of being the originator of studies in morals, and is remarkable for its exquisite polish and compression. He died in Paris, March 17, 1680, leaving some of the best memoirs of the 17th century, which were not

published complete until 1817. *Consult* Œuvres Complètes, ed. D. L. Gilbert and J. Gourdault, 1868-83; La Rochefoucauld, J. Bourdeau, 1895.

Larochejacqueslin, HENRI DUVERGER, MARQUIS DE (1772-94). A French soldier. Born of an old royalist family at Dubertien, Châtillon-sur-Sèvres, Aug. 20, 1772, he left Paris after the execution of Louis XVI, and became the military leader of the Vendean insurrection. He was killed at Nouaillé, March 4, 1794. His brother Louis, born at St. Aubin-de-Beauligné, Deux-Sèvres, left France early in the Revolution. He served under the British flag in San Domingo, and returned to France in 1801, a determined supporter of the Bourbon restoration. He organized a royalist rising in 1814, and another during the Hundred Days in La Vendée. During this latter venture he was killed, June 4, 1815.

La Rocque, FRANÇOIS, COUNT DE (1886-1946). French politician. In 1934 he founded the extreme Right, quasi-fascist organization, Croix de Feu (*q.v.*), which led to disorders in France until it was dissolved in 1936. Unlike many of his followers, he did not collaborate with the Germans during the occupation of France in the Second Great War, and in 1943 was sent to a concentration camp. After the war he lived as Col. de la Rocque under police supervision at Versailles, where he died April 29, 1946.

Larousse, PIERRE ATHANASE (1817-75). French lexicographer. Born Oct. 23, 1817, at Toucy, Yonne, he began by writing textbooks of grammar for schools, and then established a notable journal, *L'École Normale*. The great task with which his name is chiefly associated is the *Grand Dictionnaire Universel du XIXe Siècle*, 15 vols. (1866-76), supplements, 1877 and 1887. His earlier *Nouveau Dictionnaire* had reached its 30th edition by the time of his death on Jan. 3, 1875; he also published *Fleurs Latines*, 1874, a key to Latin quotations. The *Nouveau Larousse Illustré*, ed. C. Augé, appeared in 1898-1907, and was kept up to date by the monthly publication, *Larousse Mensuel Illustré*.

Larsa OR **LARSAM**. Sumerian city at Senkera, 16 m. S.W. of Shatra, S. Babylonia, now in Iraq. The Biblical Ellasar (Gen. 14), its dynasty of 16 kings, founded by a Semitic immigrant, Naplanum, about 2325 B.C., lasted until overthrown under Rimsin by Hammurabi of Babylon about 2100.

Loftus's partial excavations, 1854, revealed the temple and ziggurat (*q.v.*) of the sun-god Shamash, restored intermittently down to Nabonidus, c. 550 B.C. See *Babylonia*.

Larsen, HENRY. Contemporary Canadian navigator. A sub-inspector of the Royal Canadian Mounted Police, he was captain and navigator of the R.C.M.P. schooner *St. Roch* which, leaving Vancouver in June, 1940, made the N.W. Passage and arrived at Sydney, N.S., in Oct., 1942. In the same vessel Larsen made a return of the passage in a single season, July-Oct., 1944. See *North-West Passage*.

Larut. Dist. of Perak, in the Federated Malay States. It contains one of the most celebrated alluvial tin-mining fields in Malaya. Since 1870 the ground has been turned over and over, mainly by Chinese miners, in search of stream tin ore. The chief towns are Taiping and Kamunting.

Larva (Lat., mask). In biology, term applied to the young of any animal which, after leaving the

adult stage may be through a resting stage, as in the chrysalis that becomes a butterfly, or by gradual change, as with the frog. See *Biology*; *Insects*.

Larvik. Seaport of Norway, in the fylke of Vestfold. It stands at the head of a small fjord opening out of Oslo Fjord, 65 m. S.S.W. of Oslo. It is connected by rly. with that city, the distance being 89 m. It has shipbuilding yards, glass bottle works, and sawmills. There is some shipping, chief exports being wood pulp, stone, and ice. It has sea baths and, at Larvik Bad, mineral springs and mud baths. Pop. 11,000.

Larwood, HAROLD (b. 1904). English cricketer. Born at Nuncargate, Notts, Nov. 14, 1904, he was a miner before playing for the county in 1924. He represented England against Australia in both countries, and was top of English bowling averages in 1928, 1931, and 1932, when he took 162 wickets for 12-85 runs apiece. On the Australian tour, 1932-33, he proved the main factor in England's victories capturing 33 wickets in test matches; but his fast "body-line" bowling provoked a storm of controversy in both countries, and he refused to play in the 1934 series, which England lost. He was probably then the fastest English bowler of the century, but injuries reduced his pace and in 1938 he announced his retirement. A useful hitter, he had made centuries.

Laryngitis. Inflammation of the mucous membrane of the larynx. The acute form of laryngitis may be due to catching cold, inhaling irritating gases, drinking hot liquids, or to the lodgement of a foreign body in the larynx. There is a dry cough, the voice becomes husky, and the throat painful. Some cases exhibit a rise in temperature. The patient should not use his voice. Severe cases should be kept in bed. Dover's powder or some such preparation may be given if the irritation and cough prevent sleeping. An ice bag or cold compress, perhaps alternating with a hot pack, applied externally often relieves the irritation. Inhaling cool steam relieves local distress.

Chronic laryngitis may follow repeated acute attacks, excessive smoking, or constant over-use of



Larva. 1. Larva of dragon-fly. 2. Of crane-fly. 3. Of frog

egg, differs in essential characters, and generally in appearance, from the adult. Thus the caterpillar is the larva of the butterfly, and the tadpole that of the frog. In many creatures the larva is adapted to an aquatic life, while the adult lives upon land, *e.g.* the larvae of the toad and dragon-fly inhabit ponds, and the larvae of the land crabs pass their first stage in the sea. With the cockroach and grasshopper, etc., the larvae differ little externally from the adult, except in size and the absence of wings, and in consequence are distinguished by the name of nymphs. The change from the larval to the

the voice, as in persons who do much open-air speaking. The voice becomes hoarse and there is the feeling of tickling in the throat. The larynx may be sprayed with a solution of chlorate of potash or tannic acid, or adrenalin if quick restoration of the voice is necessary. Chronic recurrent laryngitis is often associated with dental sepsis. If the larynx is affected without obvious cause, malignant change should be suspected.

Oedematous laryngitis is a serious condition in which swelling of the epiglottis occurs. It may be the result of syphilis, tuberculosis, severe inflammation such as occurs in diphtheria or Bright's disease, or local insect stings. Mild cases may be relieved by sucking ice. In severe cases, tracheotomy may be required.

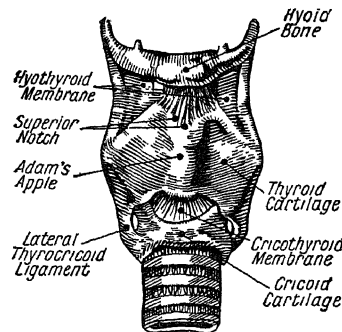
Spasmodic laryngitis, or *laryngismus stridulus*, is a nervous condition occurring in children between six months and three years of age, and often associated with rickets. Spasmodic attacks occur during which the child struggles for breath, and the face becomes congested. A sudden relaxation of the spasm follows, and the child draws the air into its lungs with a crowing sound. Sometimes convulsions occur during the attack. Treatment should be directed towards relieving the underlying rickety condition and use is made of antispasmodic drugs. Dashing cold water on the face may bring relief. See Throat; Voice.

Laryngoscope. Surgical instrument for examining the larynx and trachea or wind-pipe. Invented by Manuel Garcia (q.v.) while studying the vocal organs, it consists of a concave mirror, which is attached to the forehead of the observer by a band fastening round the head. The mirror is perforated in its centre by a small hole through which the observer looks. A ray of light from a lamp placed a little behind and to the side of the patient, who sits opposite the physician, is reflected from the mirror into the open mouth of the patient. A small mirror attached obliquely to a long handle is then introduced into the patient's mouth until it touches the uvula, the reflecting surface being directed downwards. When the light falls on this mirror, an image of the larynx and trachea is seen.

Larynx. Expanded upper part of the air passage which serves for the production of the voice. It is a cartilaginous box-like structure, situated in the front and upper part of the neck, covered at its

sides by muscles, the middle line being covered only by skin and fascia. Below, the larynx passes into the trachea or wind-pipe, and above into the pharynx. The cartilages composing the larynx are the thyroid, which is the largest and projects out in the front of the neck, forming the *pomum Adami*, or "Adam's apple"; the cricoid cartilage, shaped like a signet ring, situated below the thyroid; and smaller cartilages, the arytenoids, the cartilages of Santorini, and the cartilages of Wrisberg. The epiglottis projects upwards behind the root of the tongue.

Inside the larynx are the vocal cords. The false vocal cords are two prominent folds of mucous membrane on the sides of the larynx. The true vocal cords are composed of elastic tissue covered by mucous membrane, and are situated immediately below the false vocal cords. The space between the two true vocal cords is known as the *rima glottidis*. In speaking, a current of air is directed upwards from the lungs through the larynx, and a musical note is produced by vibrations of the true vocal cords, the movements of the cords altering their tension and thereby determining the pitch and character of the note. The articulate character of the sound when words are uttered is imparted to the note by movements of the tongue and lips. In the act of coughing or sneezing the vocal



Larynx. View from the front showing its cartilaginous structures

cords are closed, and then the pressure of the air in the lungs is increased by the action of the abdominal muscles, until the vocal cords are suddenly opened with the production of a loud noise. See Hyoid Bone; Throat; Voice.

La Salette. Village of France, in the dept. of Isère. It lies at a height of nearly 6,000 ft., 30 m. S.S.E. of Grenoble, the nearest rly. station being La Mure. It is

famous as the scene of an appearance of the Weeping Virgin (Notre Dame de La Salette), Sept. 19, 1846, the authenticity of which gave rise to much controversy. It is much frequented by pilgrims.

La Salle, RENÉ ROBERT CAVELIER, SIEUR DE (1643-87). French explorer. He was born at Rouen, Nov. 22, 1643, went to Canada as a young man and in 1669, inspired by stories told by the Indians, embarked on a voyage of discovery up the St. Lawrence, charting the northern lakes. He explored the Ohio river as far as its junction with the Missouri. Deserted by his followers, he returned to Lake Erie and set out on repeated journeys.

In 1680 he made a treaty with the western Indian tribes to curb the Iroquois, and in 1682 travelled down the Mississippi as far as the Gulf of Mexico, the first to follow that river down to the sea. He proclaimed the river and all adjacent lands as territory of France, and later was appointed governor from Michigan to the Gulf. In 1684 he landed at Matagorda Bay, Texas, mistaking it for the mouth of the Mississippi. After spending two years in fruitless attempts to find this opening, he was leading his party to Canada when they mutinied and murdered him, March 20, 1687. See Canada. Consult La Salle, L. V. Jacks, 1931.

Las Bela. State of Pakistan, in Baluchistan. It was formerly under the suzerainty of Kalat, but Kalat had no powers of interference, for the jam of Las Bela retained full control of internal administration. The state covers about 7,100 sq. m. Its capital is Bela, 115 m. N.W. of Karachi by motor road. Its chief seaport is Ormara, but land communication in the interior is faulty. A disastrous tidal wave occurred on Nov. 28, 1945. Pop. approx. 70,000.

The ruling family of Las Bela derives its descent from the Kureshi tribe of Arabia. British connexion with the state dates from 1840, when the ruling jam, at feud with Kalat, took refuge at Karachi. He was restored to power in 1877. The present ruler was given full powers in 1939, and carried on administration with the assistance of a prime minister. Civil and criminal cases are decided by a system of tribal assembly



René, Sieur de la Salle, French explorer

based on customary law. In 1947-48 Las Bela was included in an arrangement by which Kalat as an independent state had treaty rights with Pakistan.

Lasca, IL (Italian, the roach). Pseudonym of Anton Francesco Grazzini (1503-84), Italian poet and dramatist. A native of Florence and one of the founders of the Accademia della Crusca (*q.v.*), he called himself Lasca on joining the Accademia degli Umidi, each member of which adopted the name of some fish.

Lascar. Name originally used by the Portuguese to signify an inferior class of men serving in the army in India; later applied to camp followers of British armies in India. It is now generally used for boatmen from Kathiawar serving as seamen on British ocean-going vessels. At the international seamen's conference in 1920 lascars were defined as deck hands only, excluding stewards and firemen. The name lascar in British merchant shipping acts distinguishes Indian seamen from Malays and Chinese. Normally some 45,000 lascars serve with the merchant navy, and 30,000 manned British ships in the Second Great War.

Lascaris. Name of two Greek grammarians. Constantine (1434-1501) fled from Constantinople, after its capture by the Turks, to Italy. He taught Greek to the daughter of Francesco Sforza, duke of Milan. He wrote a Greek grammar, in the form of question and answer, the first Greek book printed, 1476. His brother (or cousin) Andreas (1445-1535) was a diligent collector of MSS., and edited the Greek anthology.

Las Casas, BARTOLOMÉ DE (1474-1566). Spanish missionary. Born at Seville, he studied at Salamanca, and in 1502 went to Hispaniola, where he became a priest, the first to receive holy orders in the New World. Convinced of the immorality of enslaving the Indians, he returned to Spain in 1515 to lay his views before the king. Under the title

of Universal Protector of the Indians he returned to America, where he met much opposition to his plans of reform; and, thinking to save the Indians, Las Casas made the enormous mistake of agreeing to the principle of negro slavery.

In 1520 he started a colony in Venezuela, but this was soon destroyed by the Indians. Las Casas returned discouraged to Hispaniola and entered the Dominican order, receiving the tonsure in 1522, and began his *Historia General de las Indias* (pub. 1875-76). After journeys to Mexico and Nicaragua he returned to Spain and was adviser to the Council of the Indies, 1539-44. In an era of cruelty he stands out as a humane figure, and obtained from Charles V decrees forbidding Indian slavery. In 1544 made bishop of Chiapa in Mexico, in 1547 he returned to Spain to the Dominican college in Valladolid. He died in Madrid, in July, 1566. *There are Lives* by A. Helps, 1868; F. A. MacNutt, 1909.

Las Cases, MARIN JOSEPH EMMANUEL AUGUSTIN DIEUDONNÉ, COMTE DE (1766-1842). French

writer. Born at Las Cases, Haute-Garonne, he saw service in the navy, but lived in Germany and England during the Revolution, settling in Paris as a bookseller during Napoleon's consulate. His *Atlas Historique*, 1803, attracted the notice of the emperor, who made him a count. After Waterloo he accompanied Napoleon to Rochefort, induced him to surrender to the British, and was his secretary in St. Helena until Nov., 1816. The famous *Mémorial de Sainte Hélène*, 1821-23, though based on conversations with Napoleon and memoirs dictated by him, is not altogether trustworthy. Las Cases died May 15, 1842.

Lascaux. Locality in Dordogne, France, where remarkable cave paintings were discovered in 1940. *See* N.V.

Lasco, JOHANNES, OR JAN LASKI (1499-1560). Polish scholar and reformer. Born in Warsaw, of a noble family, and educated for the church, he visited Basel, 1524-26, and adopted the Reformed faith. He organised the church of East Friesland according to the principles of the Swiss Reformers.

Compelled to seek shelter in England in 1531, he lodged with Cranmer at Lambeth, and in 1549 was appointed superintendent of the congregations of foreign Protestants at what became the Dutch church, Austin Friars. He took part in compiling the *Prayer Book* and *Articles of the Church of England*. On Mary's accession he left with his congregation for Holland and Denmark and settled again at Emden, but in 1556 was made bishop of the reformed congregation of Little Poland. He superintended the translation of the Bible into Polish, and died Jan. 13, 1560.

La Serena. A town of Chile, capital of Coquimbo prov., at the mouth of the Coquimbo river and 7 m. by rly. N.E. of the port of that name. On Feb. 27, 1818, the declaration of Chilean independence was made at this old-world city famed for its gardens and fruit. Near is the great iron mine of El Tofo. Pop. 35,000.

Lashio. Town of Burma, the headquarters of a district in the Shan State. It is 560 m. by rly. N. of Rangoon. About 80 m. from the Chinese border, Lashio was the terminus of the Burma Road (*q.v.*) into Yunnan, and so became a main objective of the Japanese offensive in 1942. The town was heavily bombed by the invaders on April 28 and seized from the Chinese next day. The Chinese 1st army retook it on March 6, 1945.

Lashkar. City of India, in Gwalior, Madhya Bharat. It is adjacent to Gwalior city on the main road and rly. In 1901-11 the town lost nearly half its population by plague. Pop. 182,492.

Lasker, EMANUEL (1868-1941). World chess champion. A German Jew, born in Berlinchen, Dec. 24, 1868, he was educated at Berlin, Göttingen, and Heidelberg universities, and became an outstanding mathematician. He won the chess championships of England, 1892; America, 1893; and the world, 1894. He resigned the last title to Capablanca in 1920, without a match; but the Cuban persuaded Lasker to meet him in 1921, and beat him 4-0, with ten draws. Lasker continued to play brilliantly in tournaments until 1936. He also propagated the Culbertson system of bridge on the Continent. Driven from Germany by the Nazis, he went to Moscow as professor of a school for chess, and then to the U.S.A., where he died Jan. 11, 1941.

Laski, HAROLD JOSEPH (1893-1950). British economist. Born in Manchester, June 30, 1893, he



Lascar stoker



Comte de Las Cases
French historian

was educated at its grammar school and New College, Oxford. During 1914-20 he lectured on history at McGill, Harvard, and Yale universities, joining then the staff of the London School of Economics. He became professor of political science at London in 1926. Attracting attention with his book *The Problem of Sovereignty*, 1917, he gained a reputation as an advanced thinker. He was appointed to the executive of the Fabian society in 1922, and of the Labour party, 1936. From 1926 he was a member of the industrial court.

Laski was chairman of the Labour party for 1945-46, and



Harold J. Laski,
British economist

an architect of its success in the general election. In a speech at Newark he was reported as advocating revolution by violence in certain circumstances. He denied this

and brought, in 1946, a libel action against the Newark Advertiser: a special jury decided he had used words open to such interpretation, and found for the defendants. As costs were extremely high, the secretary of the Labour party opened a fund to help to defray them. Similar actions against other newspapers were withdrawn. Laski died March 24, 1950.

Laski's publications include a minute analysis of Communism, 1927; *Liberty in the Modern State*, and *The Dangers of Obedience*, both 1930; *Democracy in Crisis*, 1933; *Reflections on the Revolution of Our Time*, 1943.

Las Palmas. Capital of the Canary Islands. Situated on the N.E. coast of Gran Canaria, it is a port of call with a wireless station and coaling depot. The most notable building is the 16th century cathedral, in the Flamboyant style of Spanish architecture. There are other churches, a museum, and a theatre, while Las Palmas is a health resort. Pop. 151,007. It gives its name to a prov., with area 1,565 sq. m. and pop. 366,667.

Lassalle, FERDINAND (1825-64). A German socialist, born April 11, 1825, of a wealthy Jewish family in Breslau. He was a man of brilliant ability,

and soon had the entrée to the best literary society, Heine being among his friends. Between in-



Ferdinand Lassalle,
German socialist

tervals of fashionable pursuits, in which his wealth enabled him to indulge freely, he devoted himself to democratic agitation, and came into conflict with the

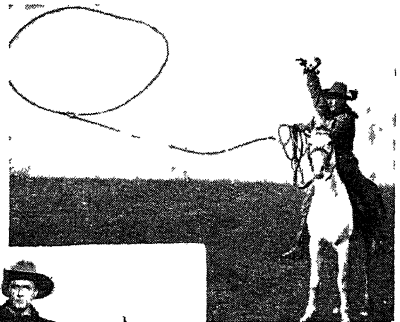
authorities in the revolution of 1848, suffering imprisonment.

After nine years in the Rhine country he returned to Berlin, and in 1861 published his *System of Acquired Rights*, which outlines his ideas on the organization of society. By 1862 he had left the Liberal party, and in 1863 was asked by the workers to formulate an effective scheme of reform. His answer was the famous open letter, which has been called the charter of German socialism. The result was the foundation of the General Working Men's Association.

Marx was associated with Lassalle in the formation of this association, but whereas Marx's ideas were international in scope, Lassalle was content to devote himself to the organization of the workers of Germany. He is believed to have had visions of a German republic with himself as president. But his schemes were cut short

by a duel with Count Racowitza, his rival for the hand of Helene von Dönniges, a brilliant young lady to whom he was passionately devoted, but who, yielding to parental persuasion, married the count. In the combat at Geneva, Lassalle received a mortal wound, and died Aug. 31, 1864. The love story of Lassalle and Helene von Dönniges forms the basis of Meredith's novel, *The Tragic Comedians*, 1881.

Bibliography. German Socialism and Lassalle, W. H. Dawson, 1888; *The Tragic Comedians*, ed. C. K. Shorter, 1891; Lassalle's Diary, ed. P. Lindau, 1891. Life, G. Brandes, Eng. trans., 1911; *The Pimrose Path*, D. Footman, 1946.



Lasso. Method of holding the coiled rope or thong. Thus grasped, it is whirled round the head and thrown, as shown above

Lassar's Paste. Useful application in the treatment of skin affections, especially for dry eczema with much scaling. Named after Oskar Lassar, German dermatologist (1849-1907), the paste consists of salicylic acid, zinc oxide, starch, and white soft paraffin as a base.

Lasso (Span. lazo, snare). Cord or thong with a

slip-noose for capturing animals. Of plaited untanned hide, 30 ft. to 100 ft. long, it is used throughout Latin America for catching horses and cattle, Pampean gauchos and Mexican cowboys being the most adept. On the N. American prairies it is a hempen rope. The coiled lasso is thrown from horseback, being whirled above the head of the operator and cast so that the noose fastens round either the leg or the head of the quarry. Tunguses and other Siberian tribes use short lassos for bringing in reindeer. Lariats are short picketing ropes. The bolas, comprising



Las Palmas, Canary Islands. View showing the massive pile of the 16th century cathedral

two or more thongs weighted with stone balls, used in pre-Spanish Peru, still survive in S. America for hunting the guanaco, puma, ostrich, and similar game. The Eskimo ensnare small birds with a miniature bolas.

Lass of Richmond Hill, THE. Song written by Leonard McNally (1752-1820), playwright and political journalist, in compliment to the lady who became his first wife, Frances L'Anson, of Richmond, Yorks. Set to music by James Hook (1746-1827) in 1789, it was first publicly sung at Vauxhall Gardens, where Hook was organist. Alternative names have been suggested for the original of both song and author. Leigh Hunt declared that Lady Sarah Lennox (1745-1826) was the lady and that the song was written by George III; while it has been suggested that Miss Crofts, of Richmond, occasioned the words, which are ascribed to William Upton. Another theory makes the song by George IV in honour of Mrs. Fitzherbert.

Lassus, ORLANDUS (c. 1532-94). Flemish composer. Known also as Orlando Lasso, he was a native of Mons, and in 1553-54 was choirmaster at S. John Lateran, Rome. He published a book of madrigals at Antwerp in 1555, and in 1556 some motets which reveal his versatility. Soon he was appointed musician to Albert V, duke of Bavaria, at whose Munich court he became kapellmeister in 1563. In his Seven Penitential Psalms, 1563-70, he aimed at dramatic expression to suit the words. Lassus ranks after Palestrina as an originator of recog-

nizably harmonised music, contributing much to both religious and secular forms of composition. He died at Munich, June 14, 1594.

Last Days of Pompeii, THE. Novel by Edward Bulwer, later 1st Baron Lytton, published in 1834. The scene is laid wholly in Pompeii, whose destruction by an eruption of Vesuvius, Aug. 24, 79, forms the catastrophe of the story. A brilliant imaginative effort, painting in almost gaudy colours the luxury of the half Grecian Campanian city where Christianity was beginning its struggle with the meretricious worship of Isis, the novel gives a vivid impression of life in the reign of Titus, and is remarkable for accuracy in matters antiquarian. With it, and with Rienzi published in 1835, Lytton reached the summit of his genius.

Last Four Things, THE. In eschatology, a collective name for death, judgement, heaven, and hell. Michelangelo, in his great fresco at the Vatican, endeavoured to give a pictorial representation of this theme; and other efforts in this direction were made by Fra Angelico, Rubens, Giotto di Bondone, Lorenzetti, Roger van der Weyden, Hans Memling, Fra Bartolommeo, Peter von Cornelius, etc. The Last Judgement is the title given to the English version of Spohr's oratorio, *Die letzten Dinge*, 1830.

Lastingham. A village of the N. Riding of Yorkshire, England. It occupies an ancient site on the moors 7 m. N.W. of Pickering. A Saxon monastery was established here in the 7th century by S. Cedd, and this was probably

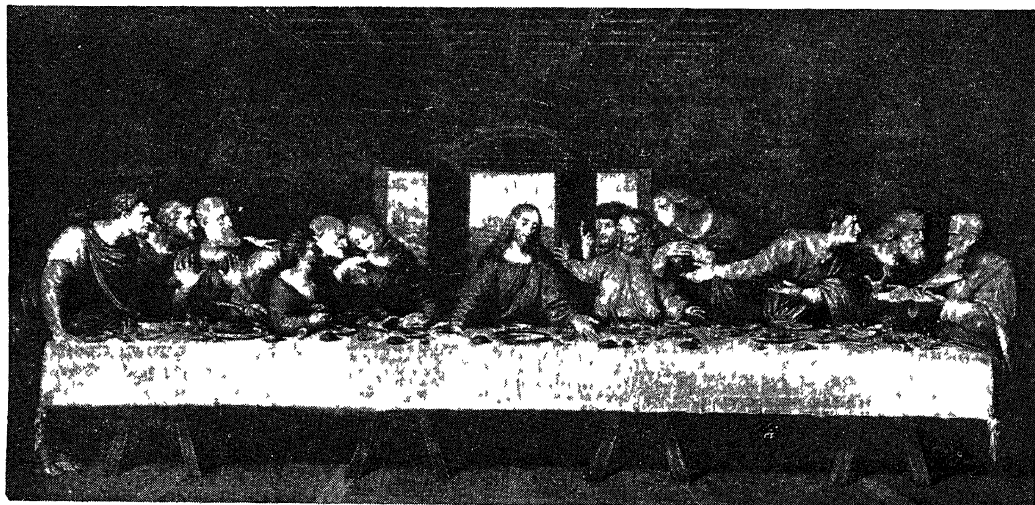
destroyed by Danes in the 9th century. The present church, of which the nave dates from about 1160, embodies ruins of the original monastery.

Last Judgement, THE. Theological conception in Jewish and Christian eschatology. By the time of the prophet Amos the Israelites had already formed the conception of a "Day of Jehovah" in which He would give His people victory over their sinful enemies and make them supreme. From the time of Amos the prophets began to think of Jehovah's day rather as a day in which He would manifest himself and punish alike Jewish and Gentile sinners (*cf.* Amos 5, *vv.* 18-20; Isa. 2, *v.* 12; 13, *vv.* 6, 9; Jer. 46, *v.* 10, *etc.*).

The course of history tended to place this day, now conceived as awful, more and more in the future. Hence, in the Messianic expectation as represented in the Apocrypha and the N.T. it becomes the great Day of Judgement. The N.T. depicts God or Christ as the judge who condemns the wicked or the unbelievers to punishment and acquits the good or the believers (*cf.* Matt. 12, *vv.* 24-30, 37-43, 47-50; 24, *vv.* 31-45, *etc.*; Heb. 12, *v.* 23).

Last of the Barons, THE. Historical romance by Bulwer (Lord) Lytton. Published in 1843, it deals with the life and death of Richard Neville, earl of Warwick, popularly called the Kingmaker.

Last of the Mohicans, THE. Novel by James Fenimore Cooper (*q.v.*), published in 1826. Uncas, Indian chief and hero of the story, is the last of one of the principal Indian tribes of N. America.



The Last Supper. Leonardo da Vinci's masterpiece depicting the scene at Jerusalem where Our Lord instituted the Eucharist, or Holy Communion, and foretold His betrayal. After the fresco in S. Maria della Grazie, Milan. See next page

Last Post. Bugle call used in the British army. It was originally sounded to summon soldiers to quarters at nightfall, and replaced the tattoo or beat of drum given in the evening to warn innkeepers to sell no more liquor to troops out of barracks. The word "post" refers to the setting of the nightly watch. Eventually, first post came to be sounded on the bugle at 9.30 p.m., last post at 10, and lights out at 10.30. Nowadays, with the greater liberty enjoyed by troops after duty, the sounding of last post survives mainly as a ceremony. It is always sounded at a military funeral.

Last Supper, THE. Paschal supper partaken of by Our Lord with His disciples on the night before His crucifixion (Matt. 26; Mark 14; Luke 22; 1 Cor. 10, 11). It was at this meal, also called the Lord's Supper, that the Eucharist, or Holy Communion, was instituted. The event has inspired some famous pictures and frescoes, by, among others, Leonardo da Vinci, Andrea del Sarto, Giotto di Bondoni, and Ghirlandaio. See Communion; Eucharist; Jesus; and illus. p. 4994.

Las Vegas. Second largest city of Nevada, U.S.A., and co. seat of Clark co. It is situated at an alt. of 2,074 ft., 335 m. E. of Los Angeles, 30 m. W. of Boulder Dam, and is served by rly. and an airport. Surrounding it is a stock-raising and mining region, products including gold and silver, gypsum and borax. Settled in 1905, it was incorporated in 1912. Pop. 8,422.

Another Las Vegas, in New Mexico, U.S.A., on the Gallinas river, consists of a city, co. seat of San Miguel co., on the E. bank, pop. 5,941, and a town on the W. bank, pop. 6,421. Settled by the Spanish before 1830, the old town was taken over by the U.S.A. after the U.S.-Mexican war of 1846. The city was settled by rly. workers in 1879, incorporated as East Las Vegas, 1888, and became a city, 1896. Sheep and cattle are raised in the vicinity, irrigation being supplied from the Conchas dam, completed 1939; and wool, hides, and dairy products are marketed.

László, PHILIP DE (1869-1937). Hungarian-born British painter. Son of a tailor, Philip Alexius László de Lombos was born at Budapest, and studied art there, later becoming a pupil of Benjamin Constant in Paris. He settled in England and became a fashionable portrait painter. Among his

subjects were Edward VII, Queen Alexandra, Lord Roberts, William II of Germany, Theodore Roosevelt, Mussolini, and Leo XIII. Later he painted Princess Elizabeth and the Duchess of Kent. A British subject from 1914, he died Nov. 22, 1937. Consult Portrait of a Painter, O. Rutter, 1939.

Latacunga. Town of Ecuador, capital of the prov. of Cotopaxi. It lies between the Western and Eastern Cordilleras in the neighbourhood of the volcano of Cotopaxi, at an alt. of about 9,100 ft., 56 m. by rly. S. of Quito. It has several times been destroyed by earthquake. It contains a former palace of the Incas, and some fine public buildings. Here is a flying field. Pop. 17,800.

Latakia OR LADIKEYAH. Seaport of Syria. The ancient Laodicea ad Mare, it lies about 70 m. N. of Tripoli. It is a centre of the silk industry, and has a considerable export trade in oil, olives, sponges, and tobacco grown on the neighbouring hills. Pop. 36,687. Latakia is also the name of a territory of Syria; pop. 432,507.

Lateen Sail (Fr. *latine*, Latin). Triangular sail suspended from a mast by a long yard, so rigged that the upper end is raised in the air at an angle of 45° and the lower end brought down to form the tack. A vessel rigged with a lateen is known as a lateener. The sail was first employed on the galleys and feluccas of Latin seafarers in the Mediterranean, and is still the typical sail of the Maltese felucca and Arab dhow. See Boat illus. p. 1242.

La Tène (Lat. *tenuis*, shallow). Ancient Celtic settlement at the northern end of Lake Neuchâtel, Switzerland. When first noticed, about 1858, it lay under the waters of the lake and was thought to be a group of lake-dwellings, but engineering operations in the locality in 1874-81 lowered the water-level and revealed a small settlement, fortified with palisades, on the left bank of the natural channel leading from Lake Neuchâtel to Lake Bièvre. Excavations were carried on here for many years.

La Tène is thought to have been a fortified post and dépôt for the storage and distribution of the weapons and other goods made by the Jura iron-workers. It is well placed near three lakes and near the ancient highway from the Rhône to the Aar and the Rhine. The absence of finds indicating the presence of women and children and the abundance of weapons

suggest that it was no ordinary village. The settlement lasted from c.250 to c.100 B.C., when it was destroyed and burnt by an enemy.

Swords predominate among the finds, but there are also spearheads, knives, axes, agricultural implements, and various brooches and other ornaments. These objects revealed a type of culture new to archaeologists, and the site has become a classic one.

THE LA TÈNE PERIOD. The name of La Tène was adopted to distinguish the culture of the second half of the Iron Age of Europe from its predecessor, the Hallstatt period. In all the phases of the La Tène period finds have been made related in type to those of the La Tène settlement, though the settlement itself existed only during the middle years of the period.

The characteristic La Tène types of ornaments and weapons are found right across Europe from Britain to Hungary. The scroll-ornament on objects from La Tène marks an early phase of that Celtic art which reached its highest development in Britain immediately before the Roman conquest.

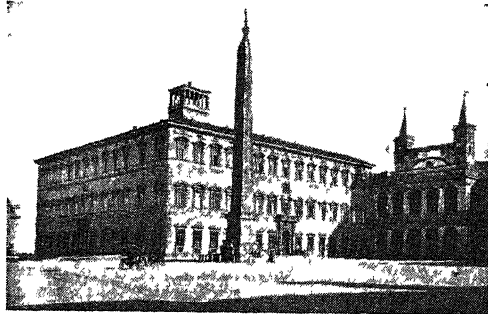
The La Tène period, 550-c.15 B.C., is approximately sub-divided into: La Tène A, 550-450; La Tène B, 450-250; La Tène C, 250-100; La Tène D, 100 to c.15. French archaeologists prefer Déchelette's classification in which A and B taken together become La Tène I, C and D correspond respectively to La Tène II and III. See Archaeology; Glastonbury; Hallstatt; Hunsbury; Iron Age.

Latent Heat. The quantity of heat required to change the state of 1 gm. of a substance from liquid to vapour (latent heat of vaporisation) or from solid to liquid (latent heat of fusion). An equal amount of heat is liberated in reversing the process. In the thawing of ice the temperature remains at 0° C. until melting is complete, although the added heat would be sufficient to raise the temperature of the same mass of water by 80° C. The change of a substance from liquid to vapour can take place at various temperatures; the value of the latent heat becoming smaller the higher the temperature at which the change takes place, e.g. water at 0° C. absorbs 597 calories per gram in vaporising and at 100° C. absorbs 539 calories per gram. Latent heats vary widely for different substances, e.g. at normal boiling-point, oxygen and methylalcohol require for a liquid to vapour change

respectively one-tenth and half as much heat as an equal weight of water. *See* Heat.

Laterality. Term in biology. An animal having a clearly distinguishable fore and hind end may have an external symmetry such that each side is virtually a mirror image of the other; internally, however, considerable and significant asymmetry is common. Reversal from the normal sometimes throws light on obscure processes of development. *See* Left-handedness.

Lateran. Palace of the popes at Rome before the transfer of the papacy to Avignon. By the time of



Lateran. The palace and, right, transept façade of the basilica of S. John Lateran, Rome

the return to Rome, the Lateran had fallen into such disrepair that the papal headquarters were removed to the Vatican. It owes its name to the ancient Roman family of the Laterani, a descendant of whom, Plautius Lateranus, was implicated in a conspiracy against Nero, and decapitated (66 A.D.).

The actual palace was erected from the plans of Domenico Fontana (*q.v.*), in 1586, and a part was used by Gregory XVI as a museum of sculpture. The chapel of the Santa Scala, approached by a staircase of 28 marble steps, is traditionally identified with the house of Pontius Pilate, who descended these steps when departing for Jerusalem. Contiguous to the palace is the famous church of S. Giovanni in Laterano, and its baptistery, the oldest in Rome. *See* Rome.

Lateran Council. A general council held in the church of S. John Lateran, the chief and mother church of the world, and the episcopal church of the pope as bishop of Rome. Of eleven synods held here, five classed as oecumenical councils are specifically known as the Lateran councils.

(1) The 9th oecumenical council held under Calixtus II, March 18–

April 3, 1123, to determine the dispute between the emperor Henry V and the Holy See, as to the right of investiture; (2) The 10th oecumenical council, presided over by Innocent II, April 20, 1139, primarily to discuss the preservation of temporalities of ecclesiastics, and to deal with the aftermath of the schism terminated by the death of the anti-pope Anacletus II; (3) The 11th oecumenical council against schismatics, held under Alexander III, March 5–19, 1179.

(4) The 12th oecumenical council, presided over by Innocent III, Nov. 11–30, 1215, concerning a crusade to the Holy Land, and internal reform of the Church. This, the fourth Lateran council, ranks as one of the three most important councils in the history of the Church. Attended by 412 bishops and 800 abbots, besides many representatives of foreign princes, it declared the supremacy of Rome, defined the Roman doctrine of trans-

substantiation, organized the suppression of heresy, dealt with ecclesiastical appointments and judicial procedure, and made financial provision for the crusade, requiring the clergy to allocate 5 p.c., and the pope and cardinals 10 p.c., of their revenues for three years towards meeting its cost, and exempting the crusaders from all burdens while on crusade. (5) The 18th oecumenical council, opened by Julius II, in 1512, and continued under Leo X until 1517. It decreed suppression of the Pragmatic Sanction, and condemned the decrees of the council of Pisa.

Laterite. In geology, a residual deposit formed as a result of rock decomposition by weathering and by sub surface waters. The deposit, often concretionary, is a common surface capping in tropical regions. Laterites consist of iron and aluminium hydrated oxides in varying proportions, occasionally constituting ore deposits. Other constituents such as clays and residual quartz are common, and the hydrated oxides may be amorphous or crystalline.

Latex. A milky juice containing proteins, sugars, alkaloids, gums, enzymes, etc., formed by a number of plants in isolated latex cells which may grow into

branched tubular latex coenocytes, or in latex vessels which are formed by the dissolution of walls between cells in rows. Latex is commonly found in members of certain families, *e.g.* Euphorbiaceae and Papaveraceae, and is readily seen when tissues containing it, *e.g.* poppy or dandelion, are cut. It is important as a source of rubber in those plants and trees which form it in quantities sufficient to pay for collection.

It is obtained by cutting the bark and letting it exude as a white liquid containing 30–35 p.c. of minute particles of rubber hydrocarbon suspended in a water medium. When evaporated, latex yields a paste or thick liquid having a rubber content of 60 p.c. It is used in the direct manufacture of rubber articles; formers of the required shape are dipped into latex and the deposited film subsequently dried and vulcanised. The rubber may be deposited on the former electrolytically. Latex may be vulcanised directly, when it is known as vultex. *See* Rubber.

Latham, CHARLES LATHAM, 1ST BARON (b. 1888). A British administrator. Born Dec. 26, 1888,



1st Baron Latham, British administrator

he was educated at a Norwich elementary school, and joined the Labour party in 1905. He became an alderman of the L.C.C. in 1928 and had a long and active career on the council, representing the S. Hackney ward 1934–46, and being leader of the council from 1940 until his retirement in 1947. From 1935 he was on the board of London Transport, and was appointed chairman of the L. T. executive, Dec., 1947. Created a peer in 1942, he was lord lieutenant of Middlesex from 1945.

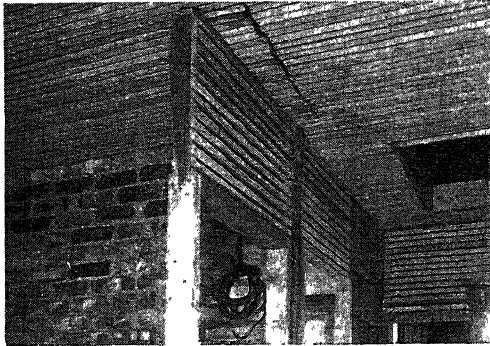
Latham, HUBERT (1883–1912). A French aviator. After several pioneer flights, he attempted the first Channel crossing in his Antoinette monoplane on July 19, 1909, a week before Blériot, but was forced to descend in the sea. Latham soon tried again and reached a point only 2 m. from Dover before falling in the Channel. In 1912 he went to Africa, where he was killed while hunting.

Latham, ROBERT GORDON (1812–88). British ethnologist and philologist. Born at Billingborough, Lincs, March 24, 1812,

and educated at Eton and Cambridge, he studied in Denmark and Norway. Appointed professor of English at University College, London, 1839, he turned to medicine, qualifying in 1842, and for seven years was connected with London hospitals. His *English Language*, 1841, and his edition of *Johnson's Dictionary*, 1866-70, represent his philological work. His *Varieties of Mankind*, 1850, preceded *Man and His Migrations*, 1851. He also wrote *Descriptive Ethnology*, 1859; and treatises on British, Indian, and Russian ethnology. He died March 9, 1888.

Lath - and - Plaster Work.

A method of building partitions, thin interior walls, or ceilings.



Lath-and-Plaster Work. Horizontal and ceiling laths fixed in position for plastering

Wooden laths, 1 in. wide, up to 4 ft. 6 ins. long, and $\frac{3}{16}$ in. to $\frac{1}{4}$ in. thick, are nailed to a studding or framework of timber. The uprights of the framework of a wall or the longitudinal lengths to carry a ceiling should be not more than 12 ins. apart, while the laths should be so nailed on that they break joint: i.e. half a dozen laths should be joined to those following on one stud or upright, the next half dozen to those on the next stud. When nailed to the studding they are covered with plaster, which is pressed between the gaps. This as it hardens forms a key at the back of the laths. Lath-and-plaster sometimes filled spaces between the heavy posts in half-timber (q.v.) work. A modern form consists of sheets of perforated metal, the perforations providing the keys for the plaster.

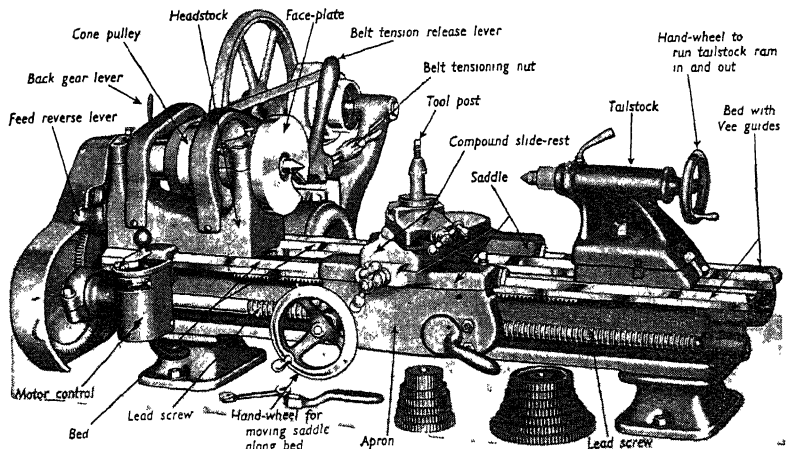
Lathe. A machine tool essentially for producing cylindrical work, but permitting many other kinds of operation to be carried out. Basically the lathe comprises (for this description the centre lathe will be taken as an example) (a) a pair of pointed centres between which the work-piece is supported and on which it is rotated by hand power, foot power, or motor; and (b) a cutting tool rigidly fixed in a tool rest or held by the operator so that the cutting edge can be brought to bear against the work.

The earliest lathes were those used for wood turning: in the pole lathe, a primitive form still used for crude work, a piece such as the blank for a chair spindle is mounted between centres and driven from a treadle by passing the driving belt around a cylindrical portion of the piece; the chisel or gouge is held against the surface of the wood, supported and positioned by a tool rest.

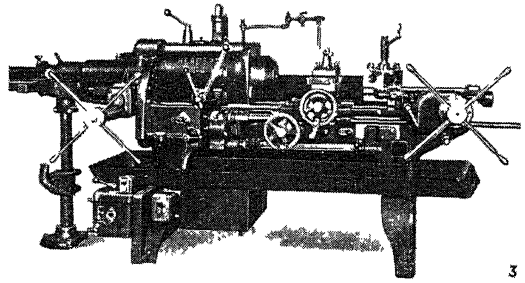
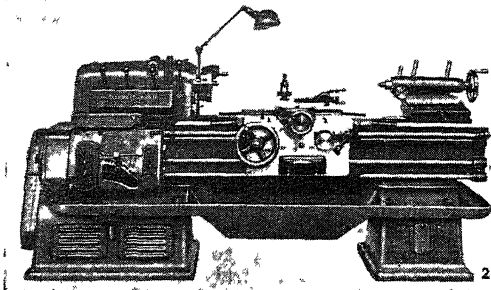
Forms of lathe for metal turning were used by clock makers, and often turned by a hand crank. An improvement which paved the way to many advances was the mechanical linking of the tool rest to the rotating headstock by means of a nut in the tool rest through which passed a long screw (known as a lead screw), this being rotated by the headstock in such a manner as to move the tool rest

(with its tool) along the bed of the lathe in cut against the work-piece. About 1797 Henry Maudslay devised means of cutting accurate lead screws, and produced a screw-cutting lathe in which screws of differing pitch could be cut on cylindrical rods by suitably arranging the ratio of the gears that transmitted the motion of the headstock to the tool rest (see Screw). Thus Maudslay elevated the lathe to a precision tool; it became truly the master tool by whose use others could be made. Hand turning gradually fell into disuse, except for such work as brass finishing. Improvements in metal turning lathes were passed on to the wood turning lathe, though hand turning lingered for much work in wood.

Only relatively long work-pieces (of cylindrical shape, or those which were to be finished cylindrical) could be mounted between centres. So there were devised various forms of chuck—fixed to the headstock—in which shorter pieces could be gripped for working, unsupported at the opposite end. Other shapes of work-piece could be bolted to a disk known as a face-plate and temporarily secured to the headstock spindle. (The principal terms are explained in Fig. 1.) Other developments were lathes for chucking and similar operations, where the piece was gripped and supported at one end only: and this improvement led to a further development in the shape of automatic lathes equipped with half a dozen headstocks, in which as many different pieces of work could be chucked and dealt with simultaneously. Vertical lathes were designed for work in which



Lathe. Fig. 1. Type of workshop lathe, with the principal parts named
Courtesy of South Bend Lathe Works, Indiana, U. S. A.



Lathe. Fig. 2. Precision tool room lathe, with quick-change gear box. Fig. 3. Capstan lathe, with turret in which several tools can be set for series operations
 Photos. Holbrook Machine Tool Co., Ltd.; Alfred Herbert, Ltd.

the horizontal position was not advantageous.

TYPES OF LATHE. With an ordinary lathe, a great variety of work, such as plain and taper turning, facing, boring, and screw cutting, can be carried out. Many different types do special work. Electric power is the usual prime mover. High speeds are necessary in many types of lathe owing to the development of cutting tools made from high speed steel and tungsten carbide, and, where extreme accuracy and finish are required, of special shaped diamond tools.

Bench or instrument lathes are mounted on benches. They are of small capacity and used for fine work such as turning items for watchmaking. Work spindle speeds are high, sometimes 8,000 r.p.m., usually infinitely variable from zero and electrically controlled.

Precision tool room lathes and universal relieving lathes are used on tool work, the former for making thread and other gauges

or any work of a precise nature; the latter for making and grinding hobs or formed cutters. Both these types require a lead screw of extreme accuracy of pitch.

The engine or centre lathe (Figs. 1 and 2) is commonly used where large quantities of repetition work are not required. In construction similar to the precision lathe, it is larger, can handle work up to several ft. in diam., and usually has more than one automatic feed for the tool slide.

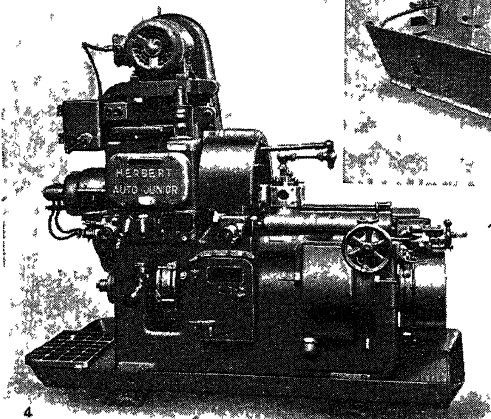
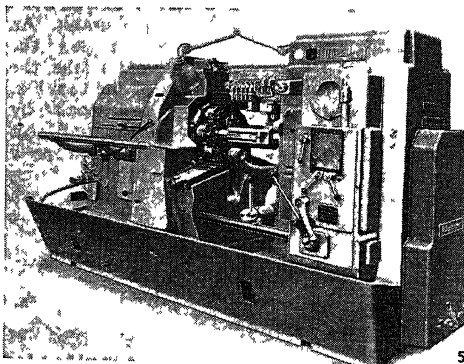
Capstan and turret lathes (Fig. 3) are used where large quantities of similar items are required. The turning and boring tools are set in revolving turrets or capstans, which control the various dimen-

rets; all motions are automatic, so that one operator can mind more than one machine (Figs. 4 and 5).

There are also lathes (single purpose machine tools) for special work, such as crankshaft turning and gun barrel turning.

MECHANISM OF LATHES. The lathe bed is a long and rigid box section, well ribbed to give maximum rigidity against the bending and torsional stresses set up by the reaction of the cutting tool, which can be considerable at high speed. On the top surface of the bed are the guides, generally inverted V guides, of the tool carriage and tailstock.

At the left end of the bed is rigidly fixed the work headstock, which carries the work spindle mounted in two or more bearings. These bearings vary according to the type of lathe; they may be of plain phosphor bronze or of white metal. Sometimes anti-friction bearings, both ball and roller (parallel or taper), are used. The connexion be-



Lathe. Fig. 4. Auto Junior lathe; automatic performance of series operations is controlled by pre-setting of cams. Fig. 5. Cam-less chucking automatic; five spindles carry chucks in which work-pieces are simultaneously machined; feed strokes are set by adjustable quadrant linkage mechanism.

Photos. Alfred Herbert, Ltd.; A. C. Wickman, Ltd.

sions of the items being machined. The mechanical feeds and the turrets, etc., are controlled by the machine operator.

Automatic lathes are similar to capstan and turret lathes, having a varying number of tools set in required

positions in turrets; all motions are automatic, so that one operator can mind more than one machine (Figs. 4 and 5).

Automatic lathes are similar to capstan and turret lathes, having a varying number of tools set in required positions in turrets; all motions are automatic, so that one operator can mind more than one machine (Figs. 4 and 5).

The tailstock, which carries a centre, can be moved along the

bed, being so constructed that it can be rigidly clamped in any desired position according to the length of work. It supports the right hand end of the work.

The carriage, saddle, or tool slide carries the apron which incorporates the feeding mechanism used for traversing the turning tool along or across the work sliding feed or surfacing feed respectively. The split nut used for screw cutting, also housed in the apron, is operated by a cam motion so that the nut can be engaged with the lead screw which imparts the required motion to the carriage. On top of the carriage (in an engine lathe) is the compound slide. The lower slide is the surface slide; the top slide can be swivelled so that taper turning can be carried out.

In turret and automatic lathes, the turret or capstan is mounted on top of the carriage.

The lead screw and feeding shafts are driven from a gear box at the left hand end of the bed, which in turn is driven from the headstock. These gear boxes are usually constructed to give a wide range of speed, some allowing over 36 changes, and make it possible to cut different threads and feeds simply by moving levers.

Lathe (A.S. *laeth*, district). The name given to a division of Kent. There are five lathes, each containing three or more hundreds, but they have now only an historic interest. See Kent.

Lathom. Village of Lancashire, England. It stands 3 m. N.E. of Ormskirk, and here is Lathom House, the seat of the former earl of Lathom. The old castle was at the time of the Wars of the Roses the seat of the Stanleys. It is famous for the defence made by Charlotte, countess of Derby, against the Parliamentarians in 1645, being one of the last places to hold out for Charles I. The present house, built in the 18th century, stands in a park 5 m. in circumference. Lathom was once a market town, and has a church dedicated to S. John. With Burscough it forms an urban district. There are two railway stations at Burscough. Pop. 7,633.

Latthraea. Latin name for the plant known as toothwort (*g.v.*).

Latifundia. Large estates possessed by the wealthy of ancient Rome. Consisting in the main of pasture land and worked almost entirely by slave labour, these latifundia had been formed to a large extent out of the *ager publicus* or public land, illegally

appropriated by patricians and the wealthy classes. The growth of latifundia led to the decay of agriculture, the depopulation of Italy, and the concentration of thousands of yeoman farmers in Rome, where they soon degenerated into a worthless mob. The extinction of the Italian peasantry was a contributory cause of the decline of the empire.

Latimer, Hugh (c. 1485-1555). English bishop and martyr. He was born at Thurcaston, near Leicester, the son of a yeoman, and was educated at Cambridge. Influenced by Thomas Bilney (*g.v.*), he embraced Lutheranism. One of the popular preachers of the Reformation period, he was appointed rector of West Kingston, Wilts, in 1531, and elevated in 1535 to the see of Worcester, having won favour at court by his support for the dissolution of Henry VIII's marriage with Catharine of Aragon. He resigned his bishopric in 1539 and was imprisoned for non-compliance

with the Six Articles, but after the death of Henry he assisted Archbishop Crammer in the revision of the Homilies.



Hugh Latimer,
English martyr

After the accession of Mary he was found guilty of heresy and burned with Ridley on Oct. 16, 1555 at Oxford where a memorial in St. Giles was erected. Latimer's last words are famous: "We shall this day light such a candle by God's grace in England, as I trust shall never be put out." Nobility of mind, toleration, and humour appear in his sermons, taken down by Thomas Some and Augustine Bernher, which are simple, forcible, and colloquial. They were edited by the Rev. G. E. Corri 1844-45. Consult Foxe's Book of Martyrs; Stow's Chronicle; Bishops Latimer and Ridley, J. C. Ryle, 1925.

LATIN LANGUAGE AND LITERATURE

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The corresponding historical article to this is that on Rome. The information given herein is amplified in the articles on the various Latin writers, e.g. Cicero; Livy; Ovid; Propertius; Virgil. See also Greek Language and Literature

Latin is one of the dialects belonging to the Indo-European group of languages, originally spoken by the Latini, inhabitants of the plain of Latium in central Italy. As the Romans gradually made themselves masters of the peninsula, this dialect established itself as the predominant literary and spoken language throughout Italy. But other Italian dialects, the most important of which were Oscan, Sabellian, and Umbrian, died hard, and in the Greek colonies of lower Italy the Greek language even survived the Roman empire itself. The main historical development of the Latin language may be divided into six periods:

(1) The pre-literary period, from the earliest times to 240 B.C. Its remains consist mainly of inscriptions, the oldest of which belongs to the 6th century B.C., legal formulae (the Twelve Tables), and ritual hymns, such as those of the college of the Arval brethren, and of the Salii, priests of Mars.

(2) The archaic period, from the beginnings of literature to Cicero (240 to 70 B.C.). The language itself now engaged the attention of the learned and there came a marked difference between the literary and the spoken language,

in great measure due to the Grecising influence of the so-called Scipionic circle. The Romans are indebted to the influence of the Greeks for their first poetical, and largely for their first prose, efforts. Special reference may be made to Livius Andronicus, a Greek from southern Italy, who in 240 began to produce plays founded on Greek originals, and to Ennius (239-170), who, by introducing the Greek hexameter in place of the native Saturnian metre, largely contributed to the development of Latin poetry.

(3) The Golden Age, from Cicero to the death of Augustus (A.D. 14). Now Latin reached its highest pitch of excellence in both poetry and prose, as exemplified in Virgil and Cicero. The separation of the *sermo urbanus*, the speech of the educated classes in Rome, from the *sermo plebeius* and *rusticus*, that of the common people and the peasantry, was definitely established. The term *sermo cotidianus* was sometimes used for the "everyday" language of the educated, a sort of compromise between the highest and the lowest forms. While there was nothing to hinder the development of the popular dialect, the

literary language proceeded on fixed lines, deviation from which is rare. To this and the following period belongs the spread of the popular language over the whole of Italy.

(4) The Silver Age, from A.D. 14 to the death of Trajan, 117. This period exhibits the reaction against the fixed standard of literary composition which had been regarded as indispensable in the Golden Age. The desire for originality and freedom of expression, unfettered by rules, led writers into excesses which contained the seeds of the coming dissolution of the language. The plain, straightforward style gave place to the rhetorical and poetical; rhetoric replaced poetry, and poetry prose. Even the historian Tacitus, the chief representative of the new school, is not free from tasteless exaggeration and a straining after effect. Trimalchio's Dinner, forming part of the satirical novel by Petronius, and the wall-inscriptions of Pompeii, furnish valuable specimens of the popular language of the period.

(5) The archaising period (117-192), from the accession of Hadrian to the death of Commodus. An effort is made to restore pre-classical Latinity, just as in later times the Comneni endeavoured to revive the language of ancient Greece in the Byzantine empire. Cicero and the literary celebrities of earlier times were now looked upon with suspicion as the real corrupters of the language. Old-fashioned and curious expressions were eagerly sought after and formed the basis of an artificial erudition. The chief representative of this movement is Fronto (c. A.D. 100), an African by birth, an orator and favourite of Hadrian and Antoninus Pius. The legal writers of the period alone preserved a certain purity of style and language. At the same time, to the archaising tendency is due the preservation of many linguistic peculiarities, which would otherwise have remained unknown.

(6) From the death of Commodus to the break-up of the spoken Latin into the Romance languages. At the beginning of the 3rd century the distinction between the *sermo urbanus* and the *sermo plebeius* and *rusticus* gradually disappeared. The written language became permeated with numerous vulgarisms, antiquarian forms, and expressions belonging to the popular speech. In addition, linguistic peculiarities asserted themselves in the provinces to such an extent that special names were given to the Latin there spoken (African, Gallic Latin). Apuleius of Madaura, the author of the Golden

Ass, the Gallic panegyrist of the age of Diocletian, and Sidonius Apollinaris are well-known names in this connexion. This led to the decay of the written language, which maintained itself longest in patristic literature. Its place was taken by the vulgar dialect. From the mixture of this with the language of the old inhabitants of the provinces arose the Romance languages of modern Europe (see Romance Languages). About the 9th century Latin was no longer a spoken language, but it was not a dead language. The study of classical Latin was limited to certain monasteries and schools, but the rise of scholasticism and the controversies on philosophical and theological matters led to an increased employment of the Latin which was in use at the time, the so-called Middle or Low Latin (see Low Latin). This, being a written language and the most highly developed of any, was better fitted than any other to be the language of the church, of scholars, and of statesmen.

Uses of the Language

The revival of humanism in the West led to a regeneration of Latin. The classics were eagerly read and imitated. Even after the end of the humanistic movement, Latin still held its ground as the language of the learned. Previous to the revival of Greek studies in the West, Latin formed the channel through which the knowledge of Greek thought was conveyed to the western world, and even after that revival it held its ground in the universities and schools. It was for long the language of diplomacy and courts, until it was ousted by French in the time of Louis XIV. The peace of Utrecht, 1713, is the first political instrument of importance written in French. Latin, however, is still the official language of the Roman Catholic world.

Like the people who spoke it, the Latin language was eminently practical. It was less capable than Greek of expressing delicate shades of meaning: its store of particles and grammatical inflexions is inferior, and it was in its nature less poetical, less imaginative. Cicero himself confesses that Greek is a more "copious" language than Latin, and his own writings show how imperfect an instrument Latin was for supplying equivalents of Greek philosophical terms.

On the other hand, Latin was eminently adapted for legal, historical, religious, and political compositions, which demanded dignity and sonority for their successful execution. Its influence

on the languages of Europe has been great, not merely confined to the countries speaking the Romance languages to which it directly gave birth. A majority of the words used in English literary, commercial, and scientific writings are borrowed from Latin (or Greek), although 75 p.c. of the language of everyday life is of Anglo-Saxon (Teutonic) origin. In the Middle Ages and during the Renaissance period, in addition to its importance for those who intended to enter the church, a speaking knowledge of Latin was considered indispensable for a gentleman. Latin speaking was also required in English grammar schools, but after the period of the Commonwealth it gradually died out in England. An attempt was made to revive it by W. H. D. Rouse, the headmaster of the Perse School, Cambridge. J. H. Freese

Bibliography. The Latin Language, W. M. Lindsay, 1894; The Making of Latin, R. S. Conway, 1923; The Sounds of Latin, R. G. Kent, 1945; The Forms of Latin, R. G. Kent, 1946.

LATIN LITERATURE. Regarded as separate from the copious Latin writings of the Middle Ages and the Renaissance, this extended over seven centuries from 240 B.C. Although largely based on Greek models, it was not a merely unoriginal literature, but the aesthetic expression of national thought, sentiment, and aspiration, enshrined in that most sonorous of ancient languages which reflected the order of Roman organization and the dignity of Roman character. The impress of Rome completely transformed the Hellenic exemplars.

Its Main Divisions

Before Greek influence operated, there was little of literary value at Rome, and traces of early Latin are scanty—fragments of laws, official records, rustic drama and litanies, with scraps of Saturnian verse which retained the primitive Indo-European accent-rhythm. Some evidence exists of long vanished heroic lays on which Niebuhr rested and overstated his ballad-theory about the sources of Roman history. But 240 B.C. is a fixed starting-point, when a Greek immigrant, Livius Andronicus, adapted a comedy and a tragedy from Greek.

The literature may be considered in three divisions:

I. 240 B.C.—70 B.C. The Earlier Literature of the Republic.

II. 70 B.C.—A.D. 14. The Golden Age, embracing the Ciceronian and the Augustan periods.

III. A.D. 14—A.D. 524. Imperial Literature.

I. In poetry the pioneers were Andronicus, Naevius, and Ennius: for their work, now in fragments, laid the foundations of drama, epic, and satire. Andronicus (d. 204 B.C.) inaugurated the *fabula palliata*, or play after the Menandrian Greek comedy of manners. He translated Homer's *Odyssey* into Saturnians for schools. Naevius (d. 199 B.C.), besides continuing the adaptation of Greek tragedies and comedies with satiric flavour, began the *fabula praetexta* or play drawn from Roman history. He was national also in using Saturnians for an epic on the first Punic War. Ennius, from South Italy, by importing the hexameter for his *Annales* on the growth of Rome, made a momentous contribution. Rugged but stately, his style in epic and drama compelled the reverence of subsequent generations and profoundly influenced Virgil. The only two comic authors from whom plays have descended are Plautus and Terence. Of the former twenty, mostly complete, survive: of the latter, six.

Comedies of Plautus

Plautus, an Umbrian, with boisterous mirth, lively colloquialisms, and Shakespearean disregard of anachronism, imparted a Roman atmosphere to his Greek originals. Much of his fun depends on the rogueries of preternaturally smart slaves, but there is considerable variety of *motif*; thus the Menaeo-hmi is the origin of Shakespeare's Comedy of Errors, the Aulularia turns on a miser's psychology, the Amphitruo is mythological, and the Rudens strikes a note of romance. Terence, an African admitted into the renowned Scipionic circle, was more restrained and finished than Plautus in his *Heccyra*, *Phormio*, *Hautontimorumenos*, *Adelphoe*, *Eunuchos*, and *Andria*. Other writers of *palliatae* were Caecilius, Trabea, Atilius, and Turpilius. A reaction in favour of *togatae*, comedies on Italian life, is seen in fragments from Titinius, Afranius, and Atta. The Oscan farce, *Atellana*, underwent literary furbishing from Pomponius and Novius, and in turn gave place to the mime, whose more reputable aspect was represented in Caesar's day by Laberius and Publilius Syrus.

After Ennius Roman tragedies were composed by Pacuvius and Accius; but neither theirs nor those of the Augustans, Varius and Ovid, are extant. The tragedies by Seneca, in Nero's time, though not intended for acting, were destined powerfully to mould drama in several modern literatures.

Satire received its true Roman colour from Lucilius. The traditional account—impugned without conspicuous success by some recent scholars—depicts the primitive *satura*, or medley, as a plotless drama eclipsed by the more artistic Hellenising plays, and, although thus lost to the theatre, transmuted into a literary miscellany of reflection and criticism. In thirty books, mainly hexametric and now very imperfectly preserved, Lucilius gave that combined personal and social note to his comments on private and public life which set a fashion inherited with kindlier spirit by Horace and with fresh vehemence by Juvenal.

Prose developed slowly to meet the needs of law, oratory, and history. The earlier Roman annalists wrote in Greek: some essayed crude experiments in their mother-tongue; but the first outstanding figure is Porcius Cato, the Censor, who made a mark in oratory, history (*Origines*), and didactic prose (*De Re Rustica*). Though clear and emphatic, his sentences lack polish and comeliness. Actual politics and theoretical rhetoric, (e.g. *Ad Herennium*, perhaps by Cornificius), united to improve oratory. Typical speakers were C. Gracchus, M. Antonius, and L. Licinius Crassus.

II. The next epoch, full of significance for European destiny because contemporaneous with the passing of the Republic (Ciceronian period) and the establishment of the Empire (Augustan period), saw the loftiest achievements of Roman genius and has deservedly been called the Golden Age. Its first generation had two great poets. Lucretius, the mouth-piece of Epicurean science, fervidly proclaiming materialism as an evangel to conquer superstition, composed his majestic *De Rerum Natura*, on the evolution of the universe from atoms and the void. Catullus, whose strength was feeling rather than thought, had a learned Alexandrian side, but is immortal for the intensely human lyrics in which he sang his passion for Lesbia.

Influence of Cicero

At the same time Latin prose, dowered with imposing amplitude and subtle cadences, was used with absolute mastery as a political and forensic instrument by M. Tullius Cicero in the speeches which proved him one of the two greatest orators of antiquity. Through his philosophical treatises, giving Latin apparel to Greek speculation, Cicero bequeathed an heirloom in vocabulary for Christian Fathers and medieval schoolmen. His

hundreds of letters, in much less formal manner, are a revelation of the man and of contemporary affairs. The encyclopedic antiquary, M. Terentius Varro of Reate, wrote on history, antiquities, agriculture, and language, and adopted in satire the Menippean blend of verse and prose. The chief historians of the day were C. Julius Caesar, whose lucid Commentaries on his Gallic campaigns, and the Civil War, found sundry continuators of less ability; Sallust, whose *Catiline* and *Jugurtha* combine something philosophic with the graphic; and the cosmopolitan biographer, Cornelius Nepos.

The Augustan period (43 B.C.-A.D. 14) was adorned by a brilliant galaxy. Virgil, exercising the borrowing prerogatives of genius, drew from Greek and Roman predecessors for his pastoral Eclogues, his *Georgics* on rural work, and his *Aeneid*. Out of the poet's devotion to Italy, his enthusiasm for her past and belief in her future, and his perception of both the glory and the sadness of life expressed in verse, now attaining heights of majesty, now sounding depths of melancholy, there was created during years of fastidious hesitancy this great epic whose hero foreshadowed Augustus as the founder of a world-empire.

Horace and his Successors

The Odes of Horace had in part also an imperial ring, but were often delightfully occasional verses of fancy and moralising, love and wine. Shrewdly conversant with human nature, his Satires owe much to Lucilius, though more genial in outlook; his Epistles are reflective and critical; and his *Ars Poetica*, without being a complete Art of Poetry, has wielded permanent influence on criticism. The elegiac poets of the time were Tibullus, Propertius, and Ovid. The first two, who died young like their greater predecessor Catullus, followed him in expressing their personal emotions in amatory verse, which, if less spontaneous and virile, introduces a new note of grace and tenderness. The genuine but immature genius of Propertius is obscured by an eccentric style. Ovid's *Amores*, *Heroides* and *Metamorphoses*, characterised by a marvellous faculty for telling a story, were life-giving springs of romance for the literature and painting of the Renaissance. Didactic was represented by Grattius's *Cynegetica* and Manilius's *Astronomica*.

Among minor prose-writers, Vitruvius treated architecture, Verrius Flaccus lexicography, and

Pompeius Trogus history, epitomised later by Justinus; but the star of Augustan prose was Livy. His massive history in about 150 books, of which nearly 35 remain, in its opulent sentences and its picturesque rather than scientific quality constituted a prose epic celebrating the progress of Rome.

III. The key to the "Silver Age," heralding the Decline, lies in the rhetorical education, whose exercises (*e.g.* *Controversiae* and *Suasoriae*, preserved by the elder Seneca) fostered ingenious argument, epigrammatic point, and far-fetched conceits. Such artifices, added to Virgilian influence, go far to account for the style of the epics of the first century, Lucan's *Pharsalia* under Nero, succeeded by Valerius Flaccus's *Argonautica*, Silius Italicus's *Punica*, and Statius's *Thebaid* and unfinished *Achilleid*. The pastoral descended from Virgil to Calpurnius Siculus in the first century, and through Nemesianus in the third to Renaissance poets like Mantuanus. Satire was continued in the Menippean form by the picaresque *Satyricon* of Petronius, and in hexameter by Persius, an earnest young Stoic elaborator of much in Horace, and by Juvenal, whose strenuous declamation and vivid realism made marvellously scathing indictments of vanities and vice. Phaedrus, a freedman, had under Tiberius struck a new satiric vein in Fables, and Martial before A.D. 100 gave the epigram its distinctive sting.

Development of Prose Style

No great elevation of prose style was reached in history by Velleius Paterculus, Valerius Maximus, or Curtius Rufus, in medicine by Celsus, in agriculture by Columella, or in geography by Pomponius Mela; but Nero's tutor, the younger Seneca, introduced in his philosophical treatises and epistles a glittering type of short pointed sentence, eminently quotable, the staccato pithiness of which was in sharp contrast to Ciceronian rotundity. Against this Senecan prose Quintilian protested by precept and example in an educational masterpiece, *The Institutes of Oratory*. Neither Frontinus's works on tactics and aqueducts nor the elder Pliny's *Natural History*, a repository of much that is curious, have pretensions to style; Pliny the Younger, however, wrote Letters scrupulously with an eye to publication and to posterity.

Pliny's friend Tacitus was the greatest prose writer of his era. In monographs on Agricola and Ger-

many, and still more in the *Histories* and *Annals*, he developed a unique prose, condensed, epigrammatic, and caustic. Later, Suetonius handled learning and history on biographic lines, *e.g.* *Lives of the Caesars*; Florus epitomised history; and Aulus Gellius wrote his literary miscellany, *Noctes Atticae*, in a leisurely manner.

Writers of Christian Times

The lethargy which beset the empire in the second century spread to literature, and some of the most vital writing came to be that of Christian apologists like Tertullian, Minucius Felix, Cyprian, Arnobius, Lactantius; but their works concern patristics rather than literature. The Vulgate or Bible translation by Jerome indelibly affected medieval Latin. A natural fruit of empire was the influence of the provinces—Spain, in the first century, could claim the Senecas, Lucan, Columella, Quintilian, and Martial; Africa, next century, Fronto and Apuleius; then Gaul continued her rhetorical influence in the third and fourth centuries. Cornelius Fronto in letters to the emperor Marcus Aurelius advocated a new style (*elocutio novella*), at once less conventional and more archaic. This tendency marks the best known work of the rhetorician Apuleius, his tale of adventure entitled *Metamorphoses*, or the *Golden Ass*, containing the romance of Cupid and Psyche.

History languished during the third and fourth centuries in the hands of the six authors of the *Historia Augusta*; Aurelius Victor and Eutropius shaped compendia; and the Greek Ammianus Marcellinus continued in rhetorical style the *Histories* of Tacitus. In the fourth century Symmachus championed paganism against Ambrose and Augustine; and Virgil-study was maintained by Macrobius and Servius. In poetry Ausonius of Bordeaux showed taste for natural beauty in his *Mosella*, and Claudian, a professional court poet, wrote on mythology as well as on current events. Among Christian poets the best was Prudentius.

The fifth century allegory of the *Seven Arts*, by Martianus Capella, was a manual which became a link with the Middle Ages; Sidonius Apollinaris, bishop of Auvergne, imitated Pliny's letters and bewailed the increasing corruption of Latin idiom. The name of Boethius fittingly closes the record; for his *Philosophiae Consolatio*, a dialogue interspersed with poems, pointed generations of medieval

readers back to the morality and literature of the ancient world.

J. Wight Duff

Bibliography. Roman Poets of the Republic, W. Y. Sellars, 3rd ed. 1889; *Latin Literature*, J. W. Mackail, 1895; *Lectures on Latin Poetry*, R. Y. Tyrrell, 1895; *Horace and the Elegiac Poets*, W. Y. Sellars, 2nd ed. 1899; *Life and Letters in the 4th Century*, T. R. Glover, 1901; *Roman Society from Nero to Marcus Aurelius*, S. Dill, 2nd ed. 1905; *Post-Augustan Poetry*, H. E. Butler, 1909; *Literary History of Rome to the Close of the Golden Age*, J. W. Duff, 1909; *Studies in Fronto and his Age*, M. D. Brock, 1911; *Roman Poetry*, E. E. Sikes, 1923; *History of Roman Literature*, H. N. Fowler, 2nd ed. 1923; *Life and Literature in the Roman Republic*, T. Frank, 1930; *Literary History of Rome in the Silver Age*, J. W. Duff, 1930; *Roman Literary Theory and Criticism*, J. F. D'Alton, 1931; *Handbook of Latin Literature*, H. J. Rose, 1936.

Latin America. General term applied to the nations of Central and South America as a whole because the lands they inhabit were first colonised by the Spaniards and Portuguese. After the discovery by Columbus of the West Indian islands in 1492, the Spaniards began to take possession of the American continent. By 1510 they were at the Panama isthmus, pushing on in 1513 to the Pacific coast. The subsequent *conquista* by Cortez, Pizarro, Alvarado, Valdivia, and Mendoza lasted until c. 1580, when Buenos Aires was founded as capital of the La Plata colonies. The *conquistadores* received all the lands they took, with the obligation to protect and Christianise the natives whom, however, they treated at best as serfs, annihilating them in the islands. The native civilizations, Aztec, Maya, Inca, they destroyed. While Spain thus established her rule from the S. tip of S. America to Florida, Texas, and California, she had, under the treaty of Tordesillas, 1494, left Brazil to Portugal, who, in 1500, sent Cabral to develop it: this was done without much fighting, but with brutal destruction of the Indian population.

In the Spanish colonies, largely in consequence of protests by Las Casas and other clergy, the government replaced the *conquistadores* by viceroys of Peru (1539) and of Mexico. The former's domain was reduced by the creation in 1739 of the viceroyalty of New Granada, capital Quito; and in 1776 of that of La Plata, capital Buenos Aires. Dutch, English, and French invaded the Spanish colonial empire;

England won Jamaica in 1655 and settlements in Honduras in 1763; the French won Haiti, the Dutch Pernambuco, and all three of them Guiana territory.

Though still subject to monopolistic and mercantilist exploitation, with slave labour, seclusion, only two regular annual "trading fleets" for the whole of the Americas, and one annual fair in Panama, one trading town, Vera Cruz, in Mexico, and two in Spain herself, Seville and Cadiz, Latin America began to prosper as the continent of great plantations. A mild policy towards the native population developed, though in Brazil its enslavement ended only in 1758; Jesuits were allowed to experiment in state building, successfully up to a point, between 1600 and 1750 in part of what is now Paraguay and Argentina (Misiones); and from the beginning of the 16th cent. negro slaves were imported into Brazil for large scale colonial farming. Subsequent cross-breeding of white, Indian, and, in Brazil, negro produced the numerous mulattos and mestizos who constitute about 50 p.c. of the population. Spaniards from Spain only were employed in the administration, and they produced an increasingly wealthy and cultured, yet politically frustrated, white aristocracy, the Creoles.

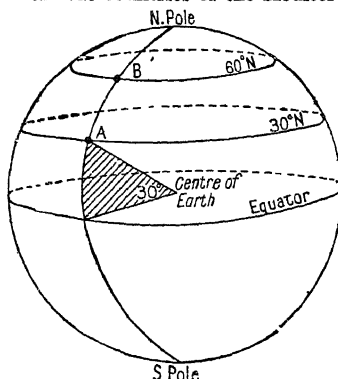
Revolt in the Spanish Colonies

This situation, between 1809 and 1822, brought about revolts, led by the South American-born General San Martin and Simon Bolivar, which succeeded, one after the other, in Venezuela, New Granada, La Plata, and Chile, sweeping away the viceroys and captains-general. Military efforts by Spain, after Napoleon's fall in 1814, brought a temporary and regional reoccupation; but a later intervention, planned in 1822 by the Holy Alliance, was frustrated by Canning's policy, backed by the U.S.A. when the Monroe Doctrine (*q.v.*) was laid down in 1823. Mexico established itself, independently, first as a monarchy, and from 1824 as a republic; Central America saw its first republic, Guatemala, born in 1824; Brazil, whither the Portuguese regent had fled when Napoleon invaded his country, became in 1822, under the regent's son Pedro, an independent monarchy that survived until 1889.

Efforts by Bolivar and his successors failed to bring the Latin American states they had created into a federation. Colombia, in

1830, split into three, Guatemala, 1839, into five republics; and several sanguinary wars (Paraguay, 1865-70, the "saltpetre war," 1879-84, the Chaco wars, 1928-29 and 1932-34) in S. America, the Mexican imperial interlude 1861-67, after the country's defeat and loss of huge territories to the U.S.A., and a series of coups d'état, showed the Latin Americans to be poorly prepared for self-government. Economically, however, they prospered: Chile with nitrates, Argentina with wheat and meat, Brazil with sugar and coffee, Mexico and Venezuela with petroleum.

All received mass immigration of Europeans, the great majority from the countries of the Mediter-



Latitude. Diagram showing how the lat. of A, 30° N., is its angular distance, measured at the earth's centre, N. of the equator. B is lat. 60° N., 30° further N. than A

anean, between 1850 and 1914. This created the middle classes previously lacking in the Latin American social structure. British financial and economic influence gave way to "dollar diplomacy," the Creoles' resentment against which has led to their increasing economic and intellectual self-reliance—a process speeded by the cutting off from Latin America of imports from Europe during both Great Wars. The 20th century development of concerted policies among all the American states is described under Pan-American Union.

Edgar Stern-Rubarth

Latina. Model town of Italy, in the prov. of Littoria. It was built by the Fascist government under Mussolini after the draining of the Pontine marsh S. of Rome.

Latin Quarter. Popular name for a district in Paris where scholars and students gather. See Quartier Latin.

Latin Union. Monetary convention made by France, Belgium, Switzerland, and Italy in 1865 to

maintain a uniform and interchangeable coinage. The union was brought about by the discovery of gold in Australia and California, which made it desirable to protect the coinage of the four countries from the relative depreciation of silver. Each country agreed to accept coins of the others. In 1874 the treaty was modified to prevent the flooding of one country by the silver coins of the others. The effect was the adoption of a gold standard for the countries concerned in place of the bimetal standard which had previously existed. The union was at a later date joined by Greece.

Latinus. Legendary king of Latium in Italy. His daughter, Lavinia, according to Virgil's story, became the wife of Aeneas (*q.v.*). Latinus is obviously an invented name, derived from Latium.

Latitude. Angular distance of a point on the earth's surface N. or S. of the equator. All places with the same angular distance lie on the same parallel of latitude, a circle on the earth's surface parallel to the equator. A difference in lat. of 1° equals, on the average, 69½ m., but since the earth is not a perfect sphere the measurement of a particular degree may differ slightly from this figure. In astronomy, the celestial latitude of an object is its angular distance N. or S. of the ecliptic. See Longitude; Map; Mensuration.

Latitudinarians (Lat. *latus*, broad). Name sometimes applied to the more extreme members of the broad school of thought in the Church of England; especially to certain prominent liberal theologians in the 17th century. Their general attitude is one of opposition to dogmatism in theology, whether expressed by High Churchmen or Evangelicals, and they seek to find a doctrinal basis broad enough to include all who can by any stretching of the term be called Christians. Among notable leaders of this school in the past may be mentioned Chillingworth, Tillotson, and Hales. See Church of England.

Latium ("flat" land). Central district of ancient Italy. Before the growth of the power of Rome it was inhabited by the Latini, a mixed race; its boundaries were the Tiber on the N., the river Numicus on the S., the Tyrrhenian Sea on the W., and the Alban Mts. on the E. From early times there existed a confederation of the Latin towns, some 30 in number, of which Alba Longa was the chief, others being Aricia, Lanuvium, and Tusculum. Roman conquests



La Trappe, France. The ancient ruined church of the Cistercian monastery, where the Trappist order originated
From an old print

and the subjugation of the Aequans, Hernicans, Rutulians, and Volscians extended the boundaries of the district, which in the time of Augustus included the country from the Tiber to the Liris (Gargliano). In 338 B.C., as the result of war against the Romans, the Latin league was dissolved and the towns ceased to have an independent existence. The position of the inhabitants was intermediate between that of full Roman citizens and the other allies (*socii*); they acquired rights of citizenship after the Social War (90–89 B.C.). Rome, situated on the banks of the Tiber, 15 m. from its mouth, was within the territory of Latium.

The name Latium survives for a compartimento of Italy, containing the provs. of Viterbo, Rieti, Rome, Frosinone, and Littoria. See Alba Longa; Campagna; Rome: History.

Latona. In Roman mythology, the mother of Phoebus and Diana. Latona was the Latin form of the Leto (*q.v.*) of the Greeks.

Latour d'Auvergne, THÉOPHILE MALO CORRET DE (1743–1800). French soldier. Born at Carhaix, Finistère, Dec. 23, 1743, he enlisted in 1767, steadfastly refused promotion beyond the rank of captain, displayed extraordinary valour during the Revolutionary wars in the Alps and Pyrenees, but was forced by ill health to leave the army in 1795. Having again volunteered, he was named by decree of April 27, 1800, first grenadier of France. On June 27 he fell at Oberhausen, Bavaria. His courage, simplicity, and modesty having made him a hero of the army, remarkable honours were paid to his memory. Bonaparte ordered his name to be kept on the roll of the 46th regiment, and called at parades, when a serjeant was to reply, Dead on the field of honour. His heart was long carried by his regiment, and his body was re-

interred in the Panthéon in 1889.

La Trappe. A monastery of France. It lies in hilly country in the dept. of Orne, 26 m. N.E. of Alençon, 2½ m. from Soligny. The house was founded as a Cistercian monastery in 1140, and under the abbacy of Armand de Rancé (1626–1700) gave its name to the Trappist order. The existing buildings are chiefly modern. See Trappists.

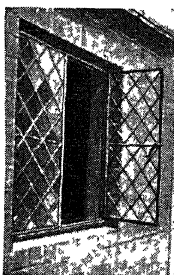
Latrine. Large form of privy (*q.v.*), used for camps, temporary hutments, etc. The receptacle for filth is a trench dug in the ground, with the seating accommodation above. Earth is sprinkled on the filth as a deodorant. After a safe period of use the trench is filled in and the site of the latrine changed.

Latrobe. Township of Tasmania, in Devon co., near the mouth of the Mersey river. There are oil-shale works here under the control of the government.

Latten (O. Fr. *laton*; Ger. *latte*, lath). Mixture of copper and zinc, closely resembling brass, and rolled into thin sheets. It was used from the 13th century onwards for monumental brasses, church vessels, and domestic utensils. It was also cast into effigies, gates, and tomb-screens, as in Henry VII's chapel at Westminster. The word now denotes normal brass mixtures for church purposes. It was once manufactured at Cologne, whence the term cullen plates.

Latter Day Saints. Abbreviated form of The Church of Jesus Christ of Latter Day Saints, the title officially adopted in 1834 by the sect commonly known by the name of Mormons (*q.v.*).

Lattice. System of diagonal bars in double triangulation, i.e. crossing each other, riveted to two



Lattice window with leaded panes

Lattice. Term used in metallurgy to describe the internal atomic structure of a solid, crystalline metal. In a liquid, such as a molten metal, the atoms are distributed at random and this amorphous structure takes up more space than when solid. When cooled, the metal ultimately reaches a stage at which it begins to solidify; the atoms move into positions so that they fit more closely together. They adopt a regular pattern and the solid is said to be crystalline. Owing to their closer proximity, they exert more force upon each other, so the solid metal is much more rigid than the liquid. As the metal cools further, the atoms get closer and the structure more rigid; this is known to the blacksmith, who heats his metal in a forge to make it more plastic.

X-ray crystallography shows that most metals crystallise in one of three forms: the face-centred cubic, the body-centred cubic, or the close-packed hexagonal lattice. There are exceptions, e.g. certain modifications of manganese or tin adopt a face-centred tetragonal lattice.

The lattice pattern is repeated an infinite number of times in every metallic grain. Distortion of the metal causes distortion of the crystal lattices of the numerous grains. Alloys crystallise in similar ways. When two metals are insoluble in each other in the solid state, as with a eutectic (*q.v.*), two kinds of crystal are formed. But if they form a solid solution, the lattice is similar to that of one of the metals. This may be due to the replacement of some atoms in one metal by atoms of the other. Less frequently, atoms of one metal squeeze between those of the other metal's crystal lattice, giving an interstitial solid solution. See Crystallography.

Lattice Leaf (*Aponogeton fenestralis*). Perennial aquatic herb of the family Aponogetonaceae. It is



Lattice Leaf. Specimen of the fresh-water plant of Madagascar, showing the curious network leaves

a native of Madagascar, where it is known as Ouvirandrano or water yam. It grows in fresh-water rivers, and has a tuberous root filled with farinaceous matter, used for food. Except at an early stage of

development, the leaves of this plant consist of a mere network of vessels enclosed in a thin layer of cellular tissue, with innumerable open circular and oblong spaces. These leaves are 1 ft. to 1½ ft. long and 3 or 4 ins. wide, with a long, thin leafstalk. The forked flower-stem supports greenish-white flowers.

Lattre de Tassigny, JEAN DE. See Tassigny.

Latude, JEAN HENRI MASERS DE (1725-1805). French adventurer, also known as Jean Danry.



Henri Masers de Latude, the French adventurer who escaped from the Bastille

From a painting in the Carnavalet Museum, Paris

Born of obscure parentage at Montagnac, Hérault, March 23, 1725, he attempted to gain a reward from the marquise de Pompadour by warning her of a poison plot against her which he had himself prepared. The device was discovered and Latude was imprisoned under *lettre-de-cachet* in 1749. He escaped from Vincennes in 1750, and thrice again after recaptures. Until 1784 he was almost continuously under arrest, chiefly in the Bastille, and he wrote skilful but inaccurate memoirs of his experiences, which won him popularity and financial redress under the Revolution. He died in Paris, Jan. 1, 1805.

Latuka or **LOTUKA**. Nilotic Negro tribe in the N. prov. of Uganda. Herdsmen and cultivators on the highlands, they and the Bari of the Nile basin to their W. gave rise to the Masai. Tall, finely built, and warlike, they interweave their hair with bark into helmet-shaped structures, encrusted with beads and cowries. Their bell-shaped huts, sometimes 25 ft. high, are grouped into villages, Tarrangole, the largest, having as many as 3,000, protected by a stockade.

La Tuque. Town in Champlain county, Quebec, Canada, on the St. Maurice River, 85 m. N. of Three Rivers. Served by the C.N.R., it has sash and door factories, a large pulp and paper mill, the plant of the Aluminium Co. of Canada, and is an important lumbering centre. Pop. 7,919.

Latvia. The land of the Letts. A constituent republic of the U.S.S.R. since Aug. 3, 1940, it is bounded N. by Estonia, E. by R.S.F.S.R., S. by Lithuania, and W. by the Baltic and the Gulf of Riga. The republic consists of Vidzeme (Livonia) in the N., Kurzeme (Courland) in the W., Zemgale in the centre, and Latgale in the S.E. The total area is 24,840 sq. m., with a frontier line of 1,117 m. and a seaboard of 307 m. In 1940 the pop. was put at 1,950,000.

Flat and low-lying, Latvia is watered by the Dvina (Daugava) and many streams, and contains marshy tracts and lakes, the largest of these being Burtneek and Lubanes. The summers are short and hot, the winters long and snowy. A quarter of the country is covered with forests; there is little mineral wealth. Moderately fertile, the soil is highly cultivated, and the principal occupations are dairy farming, raising barley, oats, flax, potatoes, and livestock, and beekeeping; there is also a fishing industry. Light engineering, chemicals, textiles and woodworking have attracted 300,000 to towns. Exports mostly go to the rest of the U.S.S.R.—timber, cereals, flax, dairy produce, and fish.

Railways radiate from Riga, the capital and principal seaport (pop. 393,211). Other towns are Liepaja (57,098); Daugavpils or Dvinsk (45,160); Jelgava (34,099); Ventspils or Windau (15,671); Rezekne (13,139). The university is at Riga (*q.v.*).

HISTORY. Letts, a people of Aryan stock who are akin to the Lithuanians, have inhabited the present Latvia since the 10th cent., but, living in tribal organizations, they lacked cohesion. Until 1918 they had always been subject to some foreign domination. Lettish is the language generally spoken, but many are fluent in German or Russian.

In 1158 Latvia was conquered by the knights of the Teutonic order, and a period of German rule ensued, the country being divided into the states of Livonia and Courland. The former was virtually independent 1347-1494. Wars with Poland and Russia so weakened Livonia that it fell an easy prey to Lithuania and was absorbed in 1560.

In 1562 Courland became a vassal duchy of Lithuania-Poland. Polish rule here lasted until 1795, but in 1629 Livonia was annexed to Sweden; in 1710 it passed to Russia, which acquired the whole of Latvia by the third partition of Poland in 1795.

Under Russian rule the cultural superiority of the German element remained unchallenged. The Letts themselves continued to be serfs, not achieving personal freedom until 1817 in Courland and 1861 in Latgale. Even then they remained small-holders dependent upon German-descended landlords, who continued to exact forced labour. About the middle of the 19th century a Lettish nationalism came into being. With the support of an active vernacular press, banks, cooperative societies, and clandestine Lett schools were formed. A standard of education and political consciousness was achieved by the Letts which placed them ahead of the Russian peasantry and inspired an ambition for autonomy.



Latvia. Map of this country, since 1940 a constituent republic of the U.S.S.R.

At the outbreak of the First Great War nearly 200,000 Letts were serving in the Russian army. They fought gallantly in defence of Riga until that city fell in Sept., 1917. Bolshevik influence caused the Lett troops to reject independence for their country, demanding the formation of an autonomous Latvia in a federated Russia. After the occupation of Courland and of Riga by the Germans, a bloc embracing all parties except Bolsheviks and German Balts aimed at setting up an independent state. With the support of the Entente Powers, the republic was proclaimed on Nov. 18, 1918. Both Germany and Russia did their utmost to destroy it, and bitter fighting continued until Aug., 1920, when all Lettish territory was freed and a peace treaty signed with the Soviet Union. In spite of their ruined industry and agriculture, the Letts soon transformed their country into a prosperous state. Agrarian reform and a general programme of higher education were embarked upon.

In the autumn of 1939 Russia made demands on Latvia for air and naval bases, and the two countries signed a mutual assistance pact on October 5. Russian troops then occupied strategic points in Liepaja and Ventspils. In June, 1940, the Letts received an ultimatum demanding free passage for Soviet troops and the formation of a government acceptable to Moscow; and two months later Latvia was incorporated in the Soviet Union as a republic. In 1941 it was rapidly overrun by German forces advancing on Leningrad; Riga and Ventspils fell on July 1. In July, 1944, the Russians struck across Latvia, taking Jelgava on the 31st. Though some of the German forces in Courland escaped, the rest were cut off from retreat by land when the Russians reached the Baltic between Memel and Liepaja on Oct. 10. Riga fell to the Red army on Oct. 13, and the campaign in Latvia ended. The 200,000 Germans in Courland did not surrender until May 13, 1945. See Russo-German Campaigns. Consult Latvia: Country and People, R. O. G. Urch, 1938.

Lauban. Town of Silesia, E. of the river Neisse, in former German territory occupied by Poland in 1945. It is on the river Queis, and the main Berlin-Breslau rly. With urban rights since the 13th century, it has a town hall of 1541, a public school of 1591, a museum,

and an agricultural school. The town was long a centre of the linen, especially handkerchief, industry, with about 5,000 workers, and had rly. shops and ceramic plants. From 1346 it belonged to a privileged league of six towns, until in 1815 it fell to Prussia. Pop. (pre-war) 16,412.

Laud, WILLIAM (1573-1645). An English prelate. The son of a clothier, he was born at Reading,



William Laud,
English prelate
From the portrait by
Van Dyck

Oct. 7, 1573, and educated there and at S. John's College, Oxford, where his tutor was John Buckenridge, an anti-Puritan. He was elected fellow in 1593 and president in 1611.

Ordained in 1600, he was successively chaplain to Charles, earl of Devon, and chaplain to Neile, bishop of Rochester, 1608. As president of S. John's he attacked Calvinism. He was made archdeacon of Huntingdon, 1615; dean of Gloucester, 1616; and bishop of St. Davids, 1621-26.

During the last-named period he became associated with Buckingham, engaged in controversy over the claims of Rome, which he opposed, and was chief ecclesiastical adviser to Charles I. Dean of the chapel royal, 1626; bishop of Bath and Wells, 1626-28; and bishop of London, 1628-33, he was responsible for the declaration prefixed in 1628 to the Thirty-Nine Articles (*q.v.*). Laud stood out generally for clerical discipline, introduced many reforms at Oxford university, of which in 1628 he was made chancellor, and was a munificent benefactor to the Bodleian.

Appointed archbishop of Canterbury in 1633, he was a member of the courts of Star Chamber and of High Commission, being concerned notably with the case of Prynne's *Histrio-Mastix* (see Prynne), and was strenuous in his efforts to secure uniformity in church practice and suppress corruption in the civil service. He proposed the formation of a bishopric for the British colonies overseas; and in Scotland, 1635-37, supported the restored episcopacy and endeavoured, with disastrous results, to introduce a new prayer book containing the Scottish Communion Office. In Ireland he introduced the acceptance of the Eng-

lish Articles. He rejected overtures from Rome, but entered into relations with the Greek Church concerning the possibilities of reunion.

After 1638 disaster overtook him. Presbyterianism conquered in Scotland; and in England, while the Laudian party was professedly anti-Roman, it was equally anti-Puritan and anti-popular. The archbishop's support of Strafford's "thorough policy" led him to use unconstitutional methods. But it was for high treason that he was impeached by the Long Parliament, Dec. 18, 1640, and sent to the Tower, March 1, 1641. His trial began March 12, 1644. In view of the impossibility of getting a conviction, the commons on Nov. 22 substituted for the impeachment a bill of attainder. This was passed by the lords without a vestige of justification on Jan. 4, 1645, and Laud was executed on Tower Hill, Jan. 10. He was buried at All Hallows, Barking, his remains being reinterred under the altar in S. John's College, Oxford, July 23, 1663.

Maintaining that "unity cannot long continue in the Church where uniformity is shut out at the front door," Laud had pure and lofty aims, but the methods he adopted were intolerant and severe. He made no allowance for legitimate diversity of religious views within one communion, and his use of political weapons to enforce religious practice was one cause of his undoing. It was and is felt by many that the logical outcome of his ecclesiastical policy would have been the supersession of Protestantism by Roman Catholicism, and that the uniformity he worked for could have been an outward uniformity only, in which the spirit of religion would have been submerged by rules and ritual. On the other hand it is held that he stood for continuity, and that to his influence was due the restoration not only of the monarchy but also of the English Church. His sermons were published in 1651 and a collected edition of his works, 1695-1700. See Charles I.

Bibliography. Cyprianus Anglicus, P. Heylyn, 1671; History of England, S. R. Gardiner, 1883-84; Life and Times, C. H. Simpmkinson, 1894; Archbishop Laud and Priestly Government, H. Bell, 1905; Life, H. R. T. Roper, 1940; The Anglicanism of W. L., E. C. E. Bourne, 1947.

Laudanum or **TINCTURE OF OPIUM.** Fluid extract of opium containing 1 p.c. of anhydrous morphine. Laudanum is made by extracting opium with boiling

water and alcohol. A dark, brownish-red liquid possessing the characteristic odour of opium, it is used for the relief of pain, but it should be given with caution. The tincture is a dangerous drug within the meaning of the Dangerous Drugs Acts. The name is perhaps derived from the Lat. *ladanum*, the resin exuding from a shrub found in Cyprus. *See* Morphia; Opium.

Laude. Religious lays in early Italian literature. They became notable at the end of the 13th cent. in the work of Jacopo dei Benedetti of Todi, called Jacopone, and later developed into the popular Sacred Representations, or miracle plays of the 16th century.

Lauder. A burgh of Berwickshire, Scotland. It stands on the Lauder, 33 m. S.E. of Edinburgh, and is the terminus of a branch railway line. Lauder was made a burgh about 1200 and has a quaint old town hall. Here in 1482 Archibald Douglas, earl of Angus, seized the earl of Mar and other favourites of James III and hanged them on the bridge, for which deed he won his nickname of Bell-the-Cat. Pop. 628.

Lauder, SIR HARRY MACLENNAN (1870-1950). Scots comedian and song writer.



Sir Harry Lauder,
Scottish comedian

He was born at Portobello, Aug. 4, 1870, and as a boy worked in a flax mill at Arbroath and as a coal miner in Lanarkshire. He made his professional debut at Hamilton, and in 1900 appeared at Gatti's, London. Appearances at the Oxford, Tivoli, and London Pavilion confirmed his reputation as the greatest living Scots comedian. During the First Great War he raised money for charity by organizing concerts, and in 1919 received a knighthood. The highest paid music hall or broadcasting artist, Lauder made his 25th tour of the U.S.A. and Canada in 1932. His comic songs, mostly written and composed by himself, included *I Love a Lassie*; *Roamin' in the Gloamin'*; *Stop Yer Tickling, Jock*. His own favourite was *The End of the Road*. Lauder appeared in the films *Huntingtower* and *Auld Lang Syne*, and wrote his reminiscences in *Roamin' in the Gloamin'*, 1928, and *Wee Drappies*, 1931. He died at his home, Lauder Ha', Strathavon, Feb. 26, 1950.

Lauder, WILLIAM (c. 1710-71). Scottish literary forger. Educated at the university of Edinburgh, he became famous as a scholar. He conceived a bitter hatred of Milton, whom, in *An Essay on Milton's Use and Imitation of the Moderns in His Paradise Lost*, 1749, he attempted to prove to be guilty of plagiarism from other 17th century poets. To this work, which excited controversy, Dr. Johnson contributed a preface. In 1750 it was proved that Lauder had interpolated in his quotations from Masenius and Staphorstius extracts from a Latin version of *Paradise Lost*. Lauder was compelled by Johnson to sign a confession and apology. He returned to the charge without success, and died destitute in Barbados.

Lauderdale, EARL OF. Scottish title borne since 1624 by the family of Maitland from Berwickshire. Sir John Maitland, secretary of state and a keeper of the great seal, was made Lord Maitland of Thirlestane in 1590, and the second lord became an earl in 1624. The next earl was John Maitland, made duke (*v.i.*) in 1672, and the third earl was his brother Charles, from whom all the later earls are descended. James, the 8th earl, was known for his advanced political outlook; he died Sept. 13, 1839. In 1806 he was made a peer of the U.K., a title that lapsed in 1863. In 1931 Ian Colin (b. 1891) became the 15th earl. He is hereditary royal standard bearer for Scotland. An eldest son would be Viscount Maitland, and the family seat is Thirlestane Castle, Berwickshire.

Lauderdale, JOHN MAITLAND, DUKE OF (1616-82). A Scottish statesman. Born May 24, 1616, at Lethington, East Lothian, son of the 1st earl of Lauderdale (died 1645), he was a zealous Covenanter and in 1643 attended the Westminster Assembly. He was prominent in the negotiations that preceded Charles I's surrender to the Scots, and in those that followed upon their later surrender of the king to the English, but, deserting his early allies, became by 1647 a champion of the king's cause.

One of the bearers of the invitation to Charles II to Scotland, he accompanied him thither in 1650, and into England, where Maitland was taken prisoner at Worcester and kept captive in the Tower and other prisons until 1660. He then joined Charles at Breda and became one of his most trusted favourites. After the Restora-

tion he was made secretary of state for Scotland. His initial L formed the last letter of the word Cabal.

Created duke of Lauderdale in 1672, he ruled Scotland with a ferocity that has made his name execrated. Charles ordered the withdrawal of the Highland troops in April, 1678, but used his personal influence to defeat the agitation for the removal of his favourite, who retained power until 1680. Then he resigned his office, and in Aug., 1682, he died. There being no male issue, his dukedom became extinct. *See* Covenanters; Scotland.



Duke of Lauderdale,
Scottish statesman

Lauds. In the Roman and Sarum breviaries, name of one of the offices of the canonical hours. In the Anglican Church morning prayer is chiefly formed from matins, lauds, and prime. Lauds was formerly recited or sung at daybreak. In the Roman breviary it consists of the Pater Noster, Ave Maria, which is omitted when said continuously after Matins, five Psalms, a chapter of the Bible, a hymn, the Benedictus, collect, and antiphon.

The Psalms include the 148th to 150th sung together as one, and from these, known as the lauds, or psalms of praise, the office takes its name. *See* Breviary; Canonical Hours; Psalms.

Lauenburg. Town of Slesvig-Holstein, W. Germany, situated in the S.E. of that *Land*, between the river Elbe, Mecklenburg, and Lübeck. It was also the name of a former duchy of Prussia. The size of the district was 456 sq. m., and it had in 1935 a pop. of 59,135, with Ratzeburg the chief town and Lauenburg, on the Elbe, the biggest. In the latter are the fine old church of S. Mary Magdalen, the dukes' mausoleum, ruins of their castle, and 16th century houses. The duchy was Germanised in the 12th century by Henry the Lion. It fell to the Brunswick-Hanover house in 1689, was occupied by the French 1803-1813, ceded to Prussia, 1815, but largely handed to Denmark in exchange for Swedish areas in Pomerania. By the peace treaty of 1864 it fell to allied Prussia and Austria, the latter selling her claim to her rival. Bismarck was made duke of Lauenburg in 1890.

Lauff, JOSEPH VON (1855–1933). German author, born at Cologne, Nov. 16, 1855. An army officer, he was appointed artistic director of the royal theatre at Wiesbaden by William II in 1898; there he produced plays on dynastic themes. Resigning 1903, he devoted his gifts to large-scale historical and rural novels in Rhenish setting. *Pittje Pittjewitt* (1900), *Karrekiek* (1902), *Kevelaer* (1910) and *Die Brinkschulte* (1913), are colourful, moving stories of farming communities and little towns of the Rhine, on whose folklore Lauff was an expert. He died at Cochem.

Laughing Gas. The chemical name of this is nitrous oxide (*q.v.*).

Laughing Jackass or SETTLER'S CLOCK (*Dacelo*). Popular name for a group of large kingfishers found in Australasia and New Guinea. They are so called from their curious gurgling cry, uttered at regular times about dusk and dawn. They are usually brown, black, and white in colour, with sometimes a tinge of bluish green. They are found in the woods, and feed largely on snakes and other reptiles, snails, insects, and small birds and mammals. *Kookaburra* is the native name. See *Kingfisher*.



Laughing Jackass, an Australian kingfisher

and feed largely on snakes and other reptiles, snails, insects, and small birds and mammals. *Kookaburra* is the native name. See *Kingfisher*.

Laughter. Expression of mirth or of the sense of something ludicrous by means of instinctive bodily movements. A deep, involuntary inspiration is followed by short, spasmodic expirations and abrupt inarticulate sounds. This audible outburst is accompanied by facial movements, and when convulsive by shaking of the sides, congestion of the neck and face, quickened pulse, and the discharge of tears. The facial movements, produced by various interrelated muscular contractions, result in the corners of the mouth being drawn upward and backward, the cheeks and upper lip raised, the eyelids more or less drawn together, with the formation of wrinkles beneath them, and the eyes brightened by increased tension. When unaccompanied by re-

spiratory disturbance the result is a smile, which is an inaudible and incomplete laugh.

Smiling apparently preceded laughter in human development, being at first an expression of bodily contentment, while laughter may have originated in agreeable physical sensations, such as tickling. In this order they emerge in the joyous experiences of childhood, which are instigated by make-believe, teasing, and play. Mirth is provoked by situations involving something incongruous or unexpected, sometimes enhanced by a more or less conscious feeling of superiority. The bodily movements are occasioned by a nervous reaction to the emotional shock thus caused. The phenomena of laughter are simulated under the influence of nitrous oxide (*q.v.*), hence called laughing gas. See *Acting*; consult *Expression of the Emotions*, C. Darwin, 1872; *Essay on Laughter*, J. Sully, 1902.

Laughton, CHARLES (b. 1899). British-born American actor. Born at Scarborough, July 1, 1899, he was educated at Stonyhurst, studied at the R.A.D.A., and made his début in *The Government Inspector*, at Barnes, 1926. He quickly achieved a leading position as a character actor, in such parts as those of Frank Pratt in *The Happy Husband*; Mr. Pickwick; Arnold Bennett's Mr. Prohack (in which he made himself up to resemble the author); and most memorably, Crispin in *A Man with Red Hair*; Hercule Poirot in *Alibi*; and Tony Pirelli in *On the Spot*. In all these he was helped rather than hindered by a heavy physique which belied and contrasted with a beautiful and expressive speaking voice. He appeared with the *Old Vic* company, 1933–34, and was the first British actor to play at the *Comédie Française*, Paris, 1936.

Entering films in 1932 with *The Devil and the Deep*, he attained world fame as

Henry VIII, Edward Moulton-Barrett, and Bligh of the *Bounty*, three of the most powerful characterisations of the screen. He later exploited a rich strain of comedy and played grotesques, e.g. in *Vessel of Wrath*, 1938, but a tendency to mannerisms detracted from the sheer force of his personality. Becoming a naturalised American citizen, his later films were all made in Hollywood. With him in several plays and films was his wife, a former burlesque actress, Elsa Lanchester (b. 1902). Her memoirs, under the title *Charles Laughton and I*, appeared 1938.

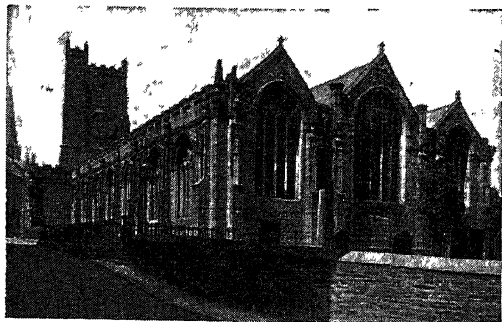
Laughton, SIR JOHN KNOX (1830–1915). A British historian. Born in Liverpool, April 23, 1830, he was educated there and at Caius College, Cambridge. From 1853 to 1855 he was a naval instructor. Then he became professor of history at King's College, London, and was secretary of the Navy Records Society, 1893–1912. Knighted in 1907, he died Sept. 14, 1915. His works include *Studies in Naval History*, 1887; *Defeat of the Spanish Armada*, 1894; and authoritative books on Nelson, his letters, dispatches, etc.

Launce. Character in Shakespeare's play, *The Two Gentlemen of Verona* (*q.v.*). He is a clownish servant to Proteus, and an example of Shakespeare's low comedy types, especially notable for his speech to his dog Crab in Act iv, 2.

Launceston. Mun. borough and market town of Cornwall, England. It stands on the Kensey, near its junction with the Tamar, 42 m. W. of Exeter and 213 from London on main and branch railway lines. The chief buildings are the church of S. Mary Magdalene, with a 14th cent. tower and some fine carving; those of S. Stephen and S. Thomas (15th cent.), and the modern town hall; while one of the town gates, in which is a museum, still stands. The

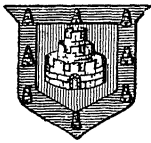


Charles Laughton, American actor



Launceston, Cornwall. Parish church of S. Mary Magdalene from the south-east
Frith

keep of the castle remains; the grounds have been made into a public promenade. The castle is



Launceston arms

the spot where princes of Wales, as lords of the duchy, receive the homage and offerings of the towns and manors therein. Launceston itself, on these ceremonial occasions, offers a pound of pepper. The town is an agricultural centre, with a weekly cattle market.

Launceston, an ecclesiastical centre with an extensive priory, and Dunheved, an adjacent military station, existed before the Norman Conquest; Dunheved had a castle very early, being the headquarters of the earls of Cornwall. Launceston became a corporate town in the 13th century, sent two members to Parliament in 1294, and was separately represented until 1885. From 1555 to 1834 it was governed under a charter granted by Mary, and it now has a mayor and corporation. It was one of the two county towns until 1837. Across the Kensey is Newport, a small place which, 1547-1832, sent two members to parliament. It is within the present borough. Pop. 4,071.

Launceston. City in Tasmania. It stands on the Tamar in Cornwall co., at its junction with the N. and S. Esk, 40 m. S.S.E. of Port Dalrymple. The capital of the N. part of the state, it has an active seaborne trade with Melbourne and Sydney, and by rail with Hobart. The district is a rich fruit-growing one. It has smelting works in connexion with the Mount Bischoff tin mines. Population 36,100.

Launch (from Malay *lanchar*, speedy). The name given to the largest boat carried by a warship. It is used only for service which cannot be performed by the smaller boats, being hoisted inboard when not required and kept on deck. In the days of sail the launch was carvel-built, 40 ft. long, with a beam of a quarter of its length, and was propelled by twelve oars. It was usually decked over, and mounted several light guns. Large launches, propelled by steam, were introduced into the Royal Navy about the middle of the 19th century, but most naval launches are now driven by internal combustion engines. The term is commonly applied to any motor or electrically driven boat used for pleasure on inland water-

ways or close inshore. Such craft are usually decked forward to accommodate a cabin.

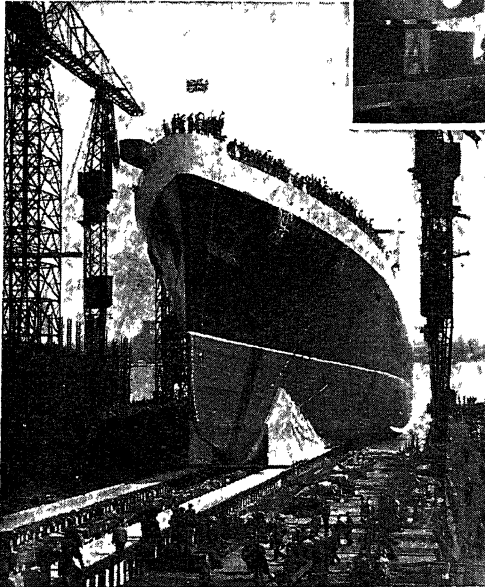
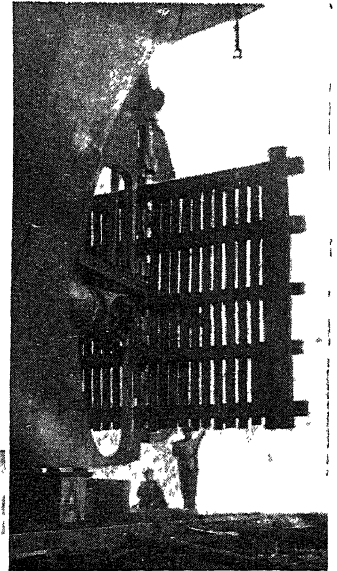
Launching. Process of moving the hull of a ship into the water from the ground upon which it has been built. The vessel is built on a slipway, variously called the ground way, permanent ways, or standing ways, which leads from the shipyard into the water. Immediately the plating of the hull is complete the scaffolding round and above the vessel is removed, the ship being held upright by a secondary, movable type of scaffolding gripping her bows and stern. This is the cradle or sliding ways, and is built up into heavy poppets, being particularly strong at the bows, where the chief weight of the hull is borne during the actual launch. The cradle goes down the ways with the ship.

To prevent the ship prematurely launching herself, the cradle is held on the slipway by massive struts, which are controlled by mechanically-operated triggers. Any tendency for the hull to slip sideways in the cradle is pre-

vented by hundreds of wooden baulks placed amidships under the flat part of the bottom. Before the launch, the hull is jacked up and launching ways are inserted; these are heavy timbers set like twin railway lines and running from end to end of the ship's bottom. When the Queen Elizabeth

was launched at Clydebank in 1938, the launching ways were 900 ft. long and greased with 7 tons of oil and tallow.

With the pressing of an electric button on the launching platform, the triggers on the ways release the struts and the hull slides into the water under its own weight. Should it gain too much momen-



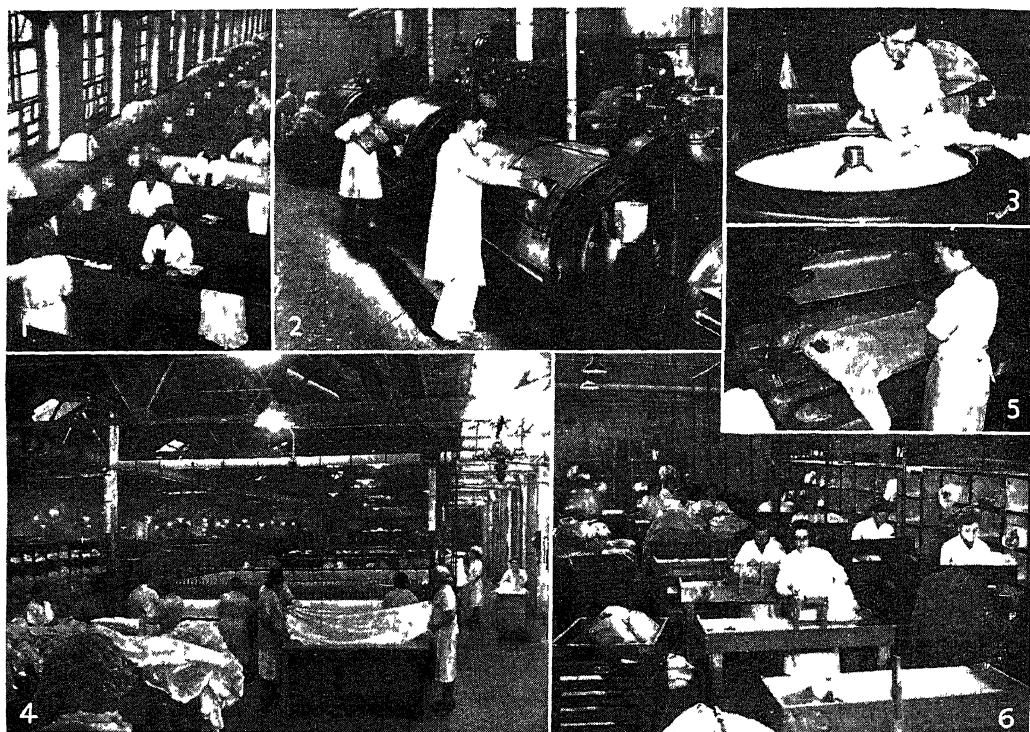
Launching. The Cunard liner *Mauretania* taking the water at her launch at Birkenhead, July, 1938. Top right, wooden gate erected on the stern of a vessel to act as a brake at her launching

tum, the speed is checked by heavy drag chains. In the event of the hull sticking on the ways, hydraulic rams give the necessary impetus. Launching is one of the quickest processes in shipbuilding; the 40,000-ton hull of the Queen Elizabeth was moved from land to water in 90 seconds.

Normally a ship is launched stern first, but where the yard faces a narrow

river she may be launched broadside. The largest vessel launched in this way was the *Great Eastern*, on the Thames, in 1858. Broadside launching is common in Mediterranean shipyards. Occasionally ships are built in a dry dock and floated out by the admission of water. Small vessels may be

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Laundry. 1. Sorting room. 2. View of the wash-house and loading machines. 3. Hydro-extractor; clothes ready for unloading. 4. Ironing department. 5. Pressing a shirt. 6. Packing room

launched with engines and fittings on board, but of big ships the hull only is launched, construction being completed in an adjacent basin. Often rehearsals are carried out with a scale model.

Launching a ship is invariably made the occasion of a naming ceremony; some distinguished person, generally a lady, releases the triggers, breaks a bottle of wine against the bows, and names the ship immediately before the hull begins to move.

Laundry (O.Fr. *lavanderie*, from Latin, *lavandus*, to be washed). Term for a place where washing or laundering of clothes is carried on; also for the articles sent there. Laundry work is one of the essential and primitive household occupations, and has not been relegated entirely to establishments of the factory order, even in highly civilized countries. The old method of washing by beating household linen and wearing apparel on stones in running streams is still practised.

Laundering in the home can be accomplished with a tub with a dolly or posser for agitating the articles in soapy water; a board to assist scrubbing; a copper for boiling white linen; a wringer for extracting moisture and smooth-

ing out creases after drying; and ordinary flat irons. Electric washing machines eliminate the dolly and the rubbing board. Electric irons are easier to operate than flat irons, and small electrically heated and driven machines are available. Some American houses have a scientific clothes-drying chamber.

As the inconvenience of drying the wet articles still remains, this and the shortage of domestic labour have led to the almost universal practice of sending the bulk of the work to a commercial laundry. In large towns, facilities are made available to women for doing the family washing at municipal public baths and wash-houses. Appliances provided may be used on payment of a small fee. In the U.S.A. electric washing and drying machines, installed in shops, etc., may be hired by the hour at an inclusive charge.

Since 1918 there has been considerable advance in the methods and equipment of commercial laundering. Previously there were hand laundries, in which processes were carried out by hand washing and wringing, outdoor drying, the box mangle, and hand irons. It is claimed that these methods do not differ in kind from those of the household. Few hand laundries

remain, and even those do not confine themselves to such simple methods. The commercial laundry is fully mechanised. The washing processes are carried out in rotating cylinders, the insides of which are corrugated to form a rubbing board. Under automatic control the amounts of water, soap, soda, and the times of each phase are measured accurately for each load of work. In place of wringers or mangles, hydro-extractors remove water by centrifugal force. The complete drying out of flat work, *i.e.* sheets, pillow slips, table linen, and smooth towels, is done on large calenders; a calender consists of one or more padded rollers rotating on a steam-heated steel bed, the damp work being fed mechanically between the bed and the rollers. Rough towels are dried by hanging in a current of hot air, or in a revolving drum. Wearing apparel is dried and ironed on presses, which consist of a padded table and a steam-heated metal head.

In 1920 the British Launderers Research Association was formed. This body is included in the government scheme for scientific and industrial research and receives a grant from the government. During the Second Great

War it advised the forces on laundry problems in the field; on washing clothing impregnated with explosives; on the decontamination of service and civilian clothing in the event of mustard gas attack; on the cause and prevention of shrinkage of woollen garments; and on prevention of cross-infection with hospital linen. Investigation of all the phases of laundry work is carried out in laboratories at Hendon.

Laundries in Great Britain come under the Public Health Acts in respect of clothing, bed linen, etc., used by persons suffering from notifiable infectious diseases. Anyone who knowingly sends infected linen to a laundry without proper precaution is liable to a fine; as is a laundryman who knowingly allows danger of infection from such linen. Stoves for heating irons must be separated from any ironing room. No gas emitting noxious fumes may be used.

The headquarters of British laundries is the Institution of British Launderers Ltd., at 17, Lancaster Gate, London, W.2. Training for executive positions in the industry is provided by courses, one of which takes the form of a scholarship tenable at a university and leads to the B.Sc. degree. Other courses are arranged at technical colleges and lead to certificates from the London City and Guilds examinations. Since 1945, pay and conditions in laundries have been greatly improved to attract the best type of worker.

Laura. A feminine Christian name. The Latin word for a laurel, it is sometimes regarded as the feminine of Lawrence. Its most famous bearer was the lady to whom Petrarch addressed his sonnets. Little for certain is known about her, but she died April 6, 1348. See Petrarch.

Laura (Gr., monastery). Name given to the monastic communities of Egypt and Syria, which flourished mainly in the 5th century. They consisted of a collection of separate cells or hermitages in which the monks led solitary lives, meeting only for the services in church and for one or two meals in common during the week. They were under the government of a superior, but his control seems to have been lax. As community life developed under the rule of S. Basil, this solitary monastic life was gradually abandoned. See Asceticism; Monasticism.

Lauraceae. A large family of trees and shrubs. They are natives chiefly of the tropics. The

majority have leathery, evergreen leaves, and small greenish flowers in various clusters. The leaves and bark are furnished with a volatile oil which gives the trees their valuable aromatic quality. They include sweet bay (*Laurus nobilis*), cinnamon, camphor, sassafras, and avocado pear.

Laurel (Lat. *laurus*, bay-tree). Loosely applied popular name for many unrelated evergreen shrubs and trees, but understood when used without prefix to refer to the garden laurel, more correctly known as



Laurel. Leaves and flowers of common laurel. Top, right, fruit of the bay-tree, *L. nobilis*

cherry laurel (*Prunus laurocerasus*). The true laurel of the ancients is the bay-tree (*Laurus nobilis*). *Prunus lusitanica* is distinguished as Portugal laurel. Other laurels are Alexandrian (*Danae racemosa*) and Spurge (*Daphne laureola*). American laurels are the several species of *Kalmia*; mountain laurel may be either *Ocotea bullata*, *Kalmia latifolia*, or *Umbellularia californica*. The Japan laurel is *Aucuba japonica*; and *Rhododendron maximum* is known in the U.S.A. as the great laurel. See Bay-tree; Cherry Laurel; Daphne.

Laurelia. Small genus of trees of the family Monimiaceae. It contains three species only, one a native of New Zealand and two of Chile. The opposite, leathery leaves, when bruised, give out an aromatic odour like that of the bay. *L. novae-zealandiae* grows to a height of 150 ft., and its trunk spreads out at the base into strong buttresses 15 ft. thick. The wood, yellow and soft, is used for boat-building. The Chilean species, *L. sempervirens* and *L. serrata*, share the aromatic properties of the other.

Laurence, SAMUEL (1812-84). British portrait painter. Born at Guildford, he first exhibited at the R.A. in 1836. His associations were

mainly literary; Carlyle, Dickens, Thackeray, and Browning were painted by him, and one of his best works was a portrait of Leigh Hunt. He died in London, Feb. 28, 1884.

Laurencin, MARIE (b. 1885). A French painter. Born in Paris, Oct. 31, 1885, she studied at the Lycée Lamartine, and became associated with Braque and Picasso, exhibiting at the Salon des Indépendants, 1907. Her painting and lithography were marked by original quality; the most frequent colours were pink and blue in light pastel shades, and the figures had a fragility of physique, e.g. *Cirque*, 1911; *Les Deux Soeurs*, 1914; *La Chevauchée*, 1921. She held exhibitions in London, Paris, and New York, and is represented in many private collections. She designed settings for Diaghilev's *Les Biches*, and the Comédie Française, and illustrated Gide's *La Tentative Amoureuse*. Consult biographies by R. Allard, 1921; M. Jouhaudeau, 1928.

Laurens, JEAN PAUL (1838-1921). French historical painter. Born at Fourquevaux, Haute-Garonne, he studied at the Beaux Arts and under Cogniet. He was called The Benedictine, on account of his predilection for subjects from ecclesiastical history, particularly the Inquisition. One of the artists chosen to decorate the Panthéon, he painted two scenes from the life of S. Geneviève. His two works in the Luxembourg, *The Excommunication of King Robert the Pious*, 1875, and *The Release of the Prisoners at Carcassonne* (1303), 1879, show his power in rendering tragic episodes. A commander of the Legion of Honour, he died in Paris, March 23, 1921.

Laurentian Rocks. Series of the oldest known rocks, the Precambrian. Occurring in the Laurentian Mts. of Canada, N. of the rivers St. Lawrence and Ottawa, they invade the Grenville and Keewatin series of the Canadian Shield. A subdivision of the Archaean system, they comprise granites, gneisses, quartzite, limestone, etc., more than 30,000 ft. thick, and form the geological basis of two-thirds of Canada. They are much disrupted by faults, so the Shield is broken and discontinuous. Herein are found 85 p.c. of the gold, 39 p.c. of the silver, 87 p.c. of the copper, and all the nickel, radium, platinum, and cobalt of the dominion.

Laurentic. A British ship. A White Star liner of 15,000 tons, serving as an auxiliary cruiser in

the First Great War, she was sunk by a mine off the Irish coast, Jan. 23, 1917. Carrying some £6,000,000 worth of gold bars, she went down in 130 ft. of water. Gold to the value of £4,958,000 was ultimately recovered from the wreck for an expenditure of £138,000. one of the outstanding achievements of salvage.

Laurentum. Ancient city of Latium, Italy. It is near the coast between Ostia and Ardea, about 15 m. S. of Rome. It was said to derive its name from the laurel groves, planted to counteract malaria, with which it was surrounded. The capital of Latium in early times, Laurentum fell into decay, but was rebuilt in the time of Trajan, and combined with the neighbouring city of Lavinium under the name Lauro-Lavinium.

Laurie, ANNIE (1682-1764). The heroine of the famous Scottish song of this name. Daughter of Sir Robert Laurie, of Maxwellton House, Dumfriesshire, she married in 1717 Alexander Ferguson of Craigdarroch. The song was written by her rejected suitor, William Douglas, of Fingland, Kirkcudbright, who afterwards made a runaway match with a Betty Clark, of Glenboig, Galloway. The words of the song were first printed by C. K. Sharpe, in 1824; they were remodelled in 1835 by Lady John Scott (1810-1900), who added the third verse. Like dew on the gowan lying, and also composed the music. The song became widely popular among British soldiers serving in the Crimea.

Laurier, SIR WILFRID (1841-1919). Canadian statesman. Born at St. Lin, Quebec, Nov. 20, 1841, he was educated there and at McGill university. A Roman Catholic, he had some thoughts of becoming a priest, but in 1864 he was called to the bar. He practised for a time, also editing a French weekly paper, *Le Défricheur*. In 1871 he was sent by his native district to the Quebec legislature; he sat for three years, and in 1874 was returned to the parliament at Ottawa. From 1878 until his death he represented Quebec East.

In the Liberal ranks Laurier soon made a reputation as a speaker. In 1877 he joined the cabinet as minister of inland revenue, but soon his party was driven into opposition for 18 years. Laurier became the recognized leader of Quebec Liberals, and when Edward Blake left the country was chosen chief of the whole party. In 1896 the Liberals won a general election, and Laurier

became premier, the first French-Canadian and R.C. to hold that office. Visiting London in 1897,



Sir Wilfrid Laurier,
Canadian statesman
Russell

he was knighted. He settled the religious difficulty in the schools of Manitoba; revised the tariff, giving preference to Great Britain; inaugurated the plan for a national trans-

continental railway; and was responsible for measures designed to benefit the workers. He remained in power until 1911, then led the opposition until his death at Ottawa, Feb. 17, 1919. The introduction of compulsory military service, which personally he opposed, split his followers in 1917. Laurier owed his position to his oratorical gifts and capacity for party management. His policy was "Canada first," which accounts for his partiality for reciprocity with the U.S.A. He was not enthusiastic about sending Canadians to South Africa in 1900, and opposed the proposal to build warships for Great Britain in 1910; but he supported measures committing Canada to the First Great War until it came to conscription. *Consult* Life and Letters, O. D. Skelton, 1922.

Lauriston, JACQUES ALEXANDRE BERNARD LAW, MARQUIS DE (1763-1828). French soldier. Born at Pondicherry, Feb. 1, 1763, he was educated at Briey where Napoleon was a fellow student, entered the army in 1786, and as an artillery officer saw service in the re-



Marquis de Lauriston,
French soldier

volutionary war. In 1800 he renewed his friendship with Napoleon, who raised him to the rank of general. During 1805-09 Lauriston served in Italy, Germany, and Spain, being at one time governor-general of Venice. In command of the artillery, he had a part in the victory of Wagram. In 1811 he was ambassador to Russia; in 1812-13 he was in the retreat from Moscow, and at the battles of Lützen and Leipzig, being taken prisoner in the retreat after the latter. He joined the Bourbons on the fall of Napoleon, and having been made a marquis and a mar-

shal, held his final command in a short war against Spain. He died June 12, 1828.

Laurium (Gr. *Lavrion*). In ancient Greece, a mining district in S. Attica, extending N. from Cape Sunium to Thorikos. In the time of Themistocles, the mines were so productive that the surplus of the proceeds was sufficient for the construction of 200 triremes for battle in the war against Persia. After Greece had lost her freedom the industry ceased, and Strabo (1st century A.D.) speaks of the mines as being no longer worked. The modern Laurion (*pron. Lavrion*) is a town and rly. terminus on the bay of Ergastiri, and with its port Ergastiria has a pop. of 10,000, the workers mainly engaged in the revived industry carried on by a French and a Greek company. The chief product in ancient times was silver; it is now lead, with a certain amount of cadmium and manganese.

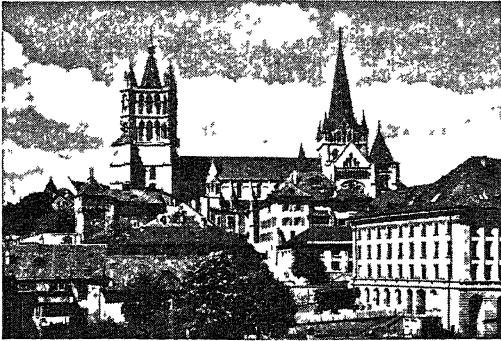
A village of Michigan, U.S.A., originally called Calumet, which lies in a rich copper district, was renamed Laurium in 1895. Pop. 3,929.

Laurustinus (*Viburnum tinus*). An evergreen shrub of the family Caprifoliaceae. It is a native of the Mediterranean region. It has oblong, opposite leaves, and bears large clusters of small white flowers, pink in bud. The berries are dark blue.

Laurvikite. A coarsely crystalline igneous rock of the syenite family, occurring at Larvik (Laurvik), in Norway. Because of its iridescent feldspar crystals, it is used as an ornamental stone for the outsides of shops, banks, and public houses.

Lausanne. City of Switzerland, capital of the canton of Vaud. It stands on the S. slope of Mt. Jorat, near the N. shore of the Lake of Geneva, on which it has its port of Ouchy, 38 m. by rly. N.E. of Geneva. Dominated by its castle and cathedral, it is divided into two parts by the Flon Valley, spanned by a fine bridge. Its streets are hilly and irregular, but picturesque. Three main railways meet here, from Geneva, Berne, and Zürich, also the Paris-Rome line which runs through the Simplon tunnel.

The Gothic cathedral of Notre Dame (now Protestant), one of the finest medieval ecclesiastical edifices in Switzerland, was founded in the 10th century, rebuilt in the 13th, and restored 1873-1906. It contains historic tombs and frescoes. In it took place the famous disputation of 1536, resulting in



Lausanne, Switzerland. Part of the city showing the cathedral of Notre Dame, and, right, the College of Science

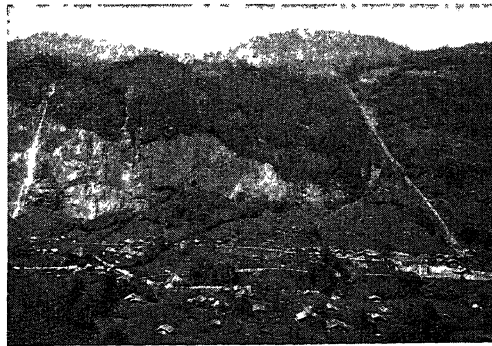
the liberation of Vaud from the supremacy of Rome and Savoy. The 15th century castle of the bishops and the Bernese bailiffs is now occupied by cantonal offices. The university, 1890, founded as an academy in 1537, was housed in 1906 in a palace which also contains the cantonal library, picture gallery, museum, etc.

Lausanne is a great educational centre, and has been the residence of numerous foreigners. Here Gibbon lived and wrote much of the *Decline and Fall*, and J. P. Kemble was buried. The city contains the federal court of justice and many literary, scientific, and philanthropic institutions. The original Roman city was destroyed by the Alemanni in the 4th century; the new town, on the hills, became a bishop's see about 590. Afterwards two settlements grew up and became incorporated in the present town, which was made the capital of Vaud in 1803. Pop. 92,541. *Provn.* Lo-zan.

Lausanne, CONFERENCE OF. Diplomatic gathering from Nov. 20, 1922, to July 24, 1923, of representatives of the Turkish Nationalist government established at Ankara and the governments of Great Britain, France, Italy, Japan, Greece, Bulgaria, and Yugoslavia. The treaty of Sèvres (*q.v.*) had not been ratified by Turkey, and a new situation resulted from the Turkish defeat in Anatolia of a Greek force enjoying Allied support. Consequently the Sèvres treaty was almost nullified by 17 diplomatic instruments signed at Lausanne. In addition to concessions in Armenia and Kurdistan, Turkey recovered Istanbul (Constantinople), Izmir (Smyrna), and E. Thrace, and secured the rectification of the Turco-Syrian frontier. The Allies placed no limitations on Turkish military and naval forces, and demanded no control

over finance. The Dardanelles demilitarised zone was reduced; Great Britain, France, Italy, and Japan guaranteed freedom of navigation through the straits in return for a conditional right of passage for their warships. Soviet Russia, at first strongly opposed to this settlement, became a signatory on Aug. 4, 1923. The terms of the agreement were modified in 1931 at Montreux (*q.v.*).

Lauterbrunnen (Ger., nothing but springs). Village of Switzerland in the canton of Berne. It is



Lauterbrunnen, Switzerland. General view of the village with the cable railway to Mürren

picturesquely placed in a rocky valley of the Bernese Oberland, $7\frac{1}{2}$ m. by rly. S. of Interlaken. A favourite tourist resort, it has many waterfalls, the Staubbach descending 980 ft. The Jungfrau and the Schwarzer Mönch are in the neighbourhood.

Lava (Ital., stream). Molten rock poured out on the earth's surface from volcanoes, fissures, etc. It may be extruded on land, or on the sea bottom in submarine eruptions. Some submarine lavas develop characteristic ellipsoidal structures, and are termed pillow-lavas. Gas escaping from lava as it flows leaves steam-holes in the consolidated mass; these are commonly filled later by minerals, when they are called *amygdales* (Gr

almond). The surfaces of lava flows become, as they move, crusted over in two ways: (1) by clinkery blocks which form a jagged covering to the flow, cascading down the front; (2) by developing a smooth skin which forms wrinkled surfaces. The two types are aphanolithic (foam-rock) and dermolithic (skin-stone) lava.

Fluidity of lava depends largely on chemical composition. Basic lavas, poor in silica and rich in magnesium, lime, iron, etc., are very fluid and will spread widely in thin flows. Acid lavas, rich in silica, are viscous and form dome-like masses or spires in crater orifices, or lie on the flanks of volcanoes. Once a lava flow is crusted over it will long retain heat and fluidity; but severing a flow near its source breaks the supply and checks movement.

Aerial bombing of lava flows in Hawaii near their point of emission has prevented much destruction. *See* Volcano.

Lavabo (Lat., I will wash). Term for the symbolical ceremony of washing the hands of the priest at the celebration of the Eucharist. It is the first word of v. 6 of Psalm 26, which, in the Roman Church,

the priest recites while the acolyte pours the water on his hands. The word is also applied to the basin used. *See* Baptism; cf. Ex. 29, v. 4; 30, v. 17-21; Matt. 27, v. 24; 1 Pet. 3, v. 21.

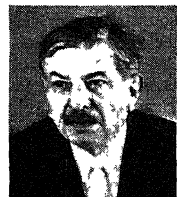
Laval. A city of France. It stands on the river Mayenne, in the dept. of that name, 186 m. W.S.W. of Paris. Notable buildings include two castles, both used now for public purposes, the cathedral of the Trinity, the



Laval, France. The old part of the town with the 12th century castle, from the north

churches of Notre Dame, S. Vénérand, and Notre Dame d'Avenières, and one of the old city gates with two towers. Laval was built round the residence of a lord named Guy, who built a castle here about 1100. Owing to its position it was the centre of fighting during the wars between English and French, and also during the civil wars. The county belonged to the family of Montmorency. Laval was occupied by the Germans in June, 1940, during their drive towards Brittany in the Second Great War. It was retaken by American armour, Aug. 6, 1944. Pop. 32,544.

Laval, PIERRE (1883-1945). A French politician. Born June 28, 1883, at Châteldon, Puy de Dôme, he was the son of a butcher of gipsy stock. At first a teacher, he took an active part in trade union politics. He moved to Paris, where he became a lawyer. Mayor of Aubervilliers in 1908, he was elected Socialist deputy for the Seine, 1914. Although he joined his regiment during the First Great War, he was on the suspected list throughout it.



Pierre Laval,
French politician

Defeated in the 1919 elections, he was re-elected in 1924, and in 1925 was appointed minister of public works under Painlevé. During 1926-40 he was Independent senator for the Seine dept. Between 1930 and 1935 he was five times prime minister; as foreign minister in 1934, 1935, and 1936, he aimed at appeasing Mussolini. (See Hoare-Laval Pact.) Laval accumulated a large fortune in the course of his political life.

With the coming of war in 1939 he intrigued for the formation of a Latin bloc consisting of France, Italy, and Spain, which would abandon Great Britain to fight Germany alone. When France surrendered in 1940 he became vice-premier, foreign minister, and successor-designate to Pétain in the Vichy govt.; but Pétain was suspicious of him, and in Dec. had him removed from office and arrested. Promptly released by the Germans, Laval spent some 16 months in Paris. He was shot and seriously wounded, Aug. 1941, at a military parade at Versailles. At the end of 1942 he returned to Vichy as head of govt., and virtual dictator of France.

Subservient as he appeared to be to the Nazis, he was not subservient enough, and he had need of all his old capacity for intrigue to keep his authority against Déat, Doriot, and Darnand, forced upon him as colleagues by the Germans. Moreover, he was not personally cruel, and though he called upon Frenchmen to volunteer for work in Germany, he took no drastic steps to round them up until 1943, when the growth of resistance stiffened his action.

After the Allies had freed Paris, Aug., 1944, Laval was taken to Germany. A Marseilles court condemned him to death *in absentia*. In May, 1945, he flew to Spain. Three months later he surrendered himself to France and was brought to trial Oct. 4-9, 1945. His advocates failing to appear in court owing to what they considered the judge's "refusal of justice," he made his own defence with characteristic skill. Altercation developed between him and the judge, who suspended the court. On its resumption, Laval refused to appear before it again. Condemned to be shot, he was executed Oct. 15, after a vain attempt to poison himself. He met death bravely, wearing his customary white tie, and refusing to be blindfolded. His own defence was published (Eng. trans.), 1948.

Lavalle, JUAN (1797-1841). An Argentine soldier. Born at Buenos Aires, Oct. 20, 1797, he entered the army. He saw service at the siege of Montevideo, 1814, distinguished himself in the campaign against Chile of 1816. In 1829 he signed the treaty with the rebel force of Rosas and retired into private life. Ten years later he took up arms once more against Rosas, but was severely defeated, and while escaping in disguise was shot dead, Oct. 8, 1841.



Juan Lavalle,
Argentine soldier

Lavallière, LOUISE FRANÇOISE, DUCHESSE DE (1644-1710). Mistress of Louis XIV. Born of good family at Tours, Aug. 6, 1644, she came to court with her mother and sisters in 1661, became maid of honour to Henrietta, duchess of Orléans, and soon attracted the attention of Louis. During a liaison which lasted some six years, she bore four children to the king; she was created duchess in 1667. In June, 1674, however, she



Duchesse de
Lavallière,
French courtier

took the veil at a Carmelite convent, dying a member of that order on June 6, 1710. She was a woman with gifts of mind as well as beauty, and her *Réflexions*

sur la Miséricorde de Dieu, written in the convent and publ. 1767, have merit. *Consult* Lives, A. Houssaye, 1895; J. Lair, Eng. trans. 1908.

Laval-Montmorency, FRANÇOIS XAVIER DE (1623-1708). A French prelate. He was born at Laval of the family of that name, April 30, 1623. He entered the church, and in 1653 was made archdeacon of Evreux. In 1659 the pope sent him to Canada with the rank of bishop, and in 1674, after another period in France, he returned as bishop of Quebec. His position there was one of great influence and he was strong enough to stand up to Frontenac, the governor, and prevent the traders from supplying liquor to the Indians.



F. de Laval-Montmorency,
French prelate

He is best known, however, as the founder of the seminary at Quebec that grew into Laval university. In 1683 he resigned his bishopric to give his entire time to educational work there. He died May 6, 1708.

Laval University. Name of two educational establishments in Canada, one at Quebec and the other at Montreal. The one at Quebec was established in 1852, a development of the seminary founded by Laval-Montmorency (v.s.). A R.C. institution under the general supervision of the archbishop of Quebec, it is modelled on the lines of the university of Paris. The faculties comprise arts, theology, law, and medicine. It has a school of forestry, a large library, laboratories, museums, and an art gallery, while several colleges in Lower Canada are affiliated to it.

Laval university at Montreal originated in 1878 as a branch of the one at Quebec. In 1919 it became independent, having been almost so since 1889. Its constitution is similar to that of the parent institution.

Lavater, JOHANN KASPAR (1741-1801). Swiss physiognomist. Born at Zurich, Nov. 15, 1741, he



Johann K. Lavater,
Swiss physiognomist

became a Protestant minister at the age of 28, and was soon distinguished for his piety and zeal. His claim to fame, however, rests on his *Physiognomische Fragmente*, 1775-78, a treatise on physiognomy which was translated into French and English. Lavater was also a poet of some merit and wrote on mysticism. When the French entered Zurich, in 1799, he was wounded while helping casualties, and this injury led to his death, Jan. 2, 1801. *Consult* Life, F. Muncker, 1883.

Lavaur. A town of France. In the dept. of Tarn, it lies on the river Agout, 36½ m. by rly. S.E. of Montauban. Silk worms are cultivated, and there are flour mills and brush factories. The 13th cent. cathedral of S. Alain ceased to be the seat of a bishop at the Revolution. Lavaur was a centre of the Albigenses, and in 1211 was taken by Simon, count of Montfort, father of the famous Simon, earl of Leicester.

Laveleye, ÉMILE LOUIS VICTOR, BARON DE (1822-92). A Belgian publicist. Born at Bruges, April 5, 1822, he studied at the universities of Louvain and Ghent. He wrote on all branches of economics; peace and international arbitration; Provençal language and literature; and the Anglo-Saxons. Appointed professor of economics at Liège in 1864, he published *La Propriété et ses Formes Primitives*, 1874; *Le Parti Clérical en Belgique*, 1874; *Le Socialisme Contemporain*, 1881, Eng. trans. 1886. His interesting *Letters from Italy*, 1880, were translated 1886. An R.C. by birth and training, he became a Protestant in later life. He was made baron in 1891, and died near Liège, Jan. 3, 1892.

Lavender (*Lavandula vera*). Shrub of the family Labiatae. It is a native of S. Europe. It has a thick, rugged-barked stem, 2 ft. high, branching above into a broad bushy head. Its downy, grey-green,

slender leaves have their edges rolled under. The mauve flowers are produced in long, erect spikes, which are gathered as soon as the flowers are fully expanded, and dried; they retain their pleasant fragrance after drying. These yield by distillation about one p.c. of the essential oil which is the basis of lavender-water. Oil of spike is another product, used by artists and in varnish making.

The plant was long grown at Mitcham in Surrey, famous for the production of lavender that yielded the finest oil; but the growth of London in that direction reduced the area of cultivation. Westcott, Surrey, is another lavender growing centre.

Lavender Cotton (*Santolina chamaecyparissus*). Sub-shrub of the family Compositae, native of



Lavender Cotton. Foliage and flower-heads, shown on the right, enlarged. Top left, floret

the Mediterranean region. Its small, narrow, alternate leaves, with rows of short, blunt teeth, give off an agreeable odour. Its yellow flower-heads are solitary, and the whole plant is clothed with cottony down.

Lavengro. Title of one of George Borrow's works, published in 1851. The word in gypsy language means word-master, and was given to Borrow in admiration by the gypsies. Autobiographical, although passages and incidents are almost certainly imaginary,

it narrates Borrow's early life and travels, his first meeting with the gypsies, and his studies in philology. The book is full of Borrow's characteristics: his love of pugilism, his hatred of Rome, and his constant excursions into philology and theology. It breaks off abruptly, but the narrative is continued in *The Romany Rye*. *See* Borrow, G.; *Romany Rye*.



Lavenham, Suffolk. Hall of the cloth-workers' Guild of Corpus Christi, reputed to be the finest of the old timbered buildings in England

Lavenham. Village of Suffolk. It is 10 m. S. of Bury St. Edmunds, with a branch line rly. station, and was once a flourishing town. There is a stone cross in the market place, and some old timber houses still stand. The Perpendicular church of SS. Peter and Paul is a fine structure. In the 16th cent., Lavenham was noted for its manufacture of cloth. Pop. 1,451.

Laver (*Porphyrha laciniata*). Seaweed belonging to the family Bangiaceae. Common on rocks at half-tide

mark, it has thin, broad fronds of tints varying from rose to purple. It is eaten with oil and lemon-juice after careful stewing, but the taste for it has



Laver. Fronds of the edible seaweed

to be acquired, and the repugnance to its appearance when cooked overcame. Green laver is the product of *Ulva latissima*, a similar plant, but of bright green colour.

Laver (Lat. *lavacrum*, vessel used for ablution). Vessel which stood in the court of the Jewish tabernacle, and held the water for the priestly ablutions. According to Ex. 30, vv. 17-21, it was of brass (bronze), and made (Ex. 38, v. 8) of the mirrors of the serving women. Solomon's temple had ten lavers



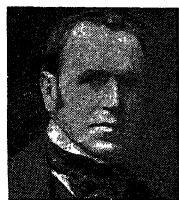
Lavender. Leaves and flower sprig of the fragrant shrub

(1 Kings 7, vv. 27-43; 2 Chron. 4, v. 6). The term laver of regeneration, (Titus 3, v. 5) occurs in the office of the ministration of the private baptism of children.

Laver, JAMES (b. 1899). British author. Born at Liverpool, March 14, 1899, he was educated at New College, Oxford, winning the Newdigate prize in 1921 with a poem on Cervantes. He specialised in the fine arts, and was an authority on etching and the history of costume and uniforms, e.g. *rococo, Regency, and Victorian periods*. His notable publications include *History of British and American Etching, 1929*; *Whistler, 1930*; *Taste and Fashion, 1937*; *Fashions and Fashion-plates, 1943*. *Nymph Errant* proved a popular musical play in 1933. Laver was keeper of prints at the Victoria and Albert museum. He wrote for this work articles on Costume and Poster.

Laveran, CHARLES LOUIS ALPHONSE (1845-1922). French physician. Born in Paris June 18, 1845, he taught at the military school of medicine at Val-de-Grâce, 1874-94. In the course of duty he spent several years in Algiers, where in 1880 he discovered the malaria-causing parasite, the existence of which had been demonstrated by Manson. Laveran received the Nobel prize for medicine in 1907, and wrote extensively on malaria and sleeping sickness. He died May 18, 1922.

Lavery, SIR JOHN (1856-1941). British painter. Born in Belfast, he studied at the Glasgow art school and in Paris. His earliest work was anecdotal in type, but his Paris training led him by degrees to a more Impressionistic style of subject and treatment. Influenced by



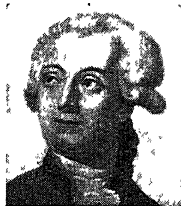
Sir John Lavery,
British painter
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Whistler and Velasquez, he painted classical subjects, and many portraits of women, by which he is represented in European galleries and the National Portrait Gallery, London. He became A.R.A. in 1911, R.A. ten years later, and was knighted in 1918. He died Jan. 10, 1941.

Lavinium. Ancient town of Latium, in Italy. It stood about 3 m. from the sea. According to tradition it was founded by Aeneas, who named it after his wife Lavinia. Lavinium became a religious centre of the Latin people.

Lavisse, ERNEST (1842-1922). French historian. Born Dec. 17, 1842, he studied history in Paris, and soon began to lecture thereon. In 1888 he became professor of history at the Sorbonne, and he was also director of the École Normale Supérieure in the university of Paris. His historical writings include works on the history of Prussia, especially the career of Frederick the Great. With Alfred Rambaud, he planned a *Histoire Générale*, a cooperative undertaking, and he edited the large *History of France*, which began publication in 1901. A great trainer of teachers, he was made a member of the Academy in 1892. He died Aug. 18, 1922.

Lavoisier, ANTOINE LAURENT (1743-94). French chemist. Born in Paris, Aug. 26, 1743, and educated at the Mazarin College, he won a prize for the best method of lighting Paris. He was made a member of the Academy of Sciences, 1768, and in 1776 was given the position of director of powder works. He sat on advisory committees on ordnance, currency, agriculture, and public health. In 1794, owing to his position as *fermier-général*, he was condemned to the guillotine. The tribunal answered the plea for saving his life by declaring, "We need no more scientists in France," and he perished, May 8, 1794.



Antoine Lavoisier,
French chemist

From a contemporary
print, Picture Post
Library

Lavoisier laid the very foundations of modern chemistry by his recognition, and his experiments to prove, that matter is indestructible. He destroyed the theory of phlogiston and named oxygen. He showed that any chemical action could be expressed by an equation, the sum of the weights of the original substances concerned being exactly equal to the sum of the weights of the resulting substances. Lavoisier's researches and methods gave an immense impetus to quantitative methods in chemistry, and the system of nomenclature which, with Guyton de Morveau and others, he proposed is still in use in its main features. *Traité Élémentaire de Chimie, 1789*, was his greatest work. Consult *Lives*, E. Grimaux, 1888; J. A. Cochrane, 1931; D. McKie, 1935.

La Voisin or MONVOISIN, CATHERINE (ex. 1680). French adventuress. The wife of a bankrupt tradesman, she took up palmistry and witchcraft, acquiring a reputation among the court ladies for her love and other potions. A large part of her trade was in poisons, and when the wholesale poison plots of 1679 came to light in Paris, implicating many of the highest ladies of the land, it was found that La Voisin had supplied the potions. She was executed Feb. 20, 1680.

Lavongal. Island of the Pacific Ocean. It is one of the group known as the Bismarck Archipelago, administered by Australia. It has an area of 460 sq. m.

Lavos. Town of Portugal, in the prov. of Beira. It stands on the estuary of the river Mondego, 24 m. W.S.W. of Coimbra, near Figueira da Foz. British forces landed here during the Peninsular War.

LAW: IN THEORY AND PRACTICE

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The companion article to this is the one on *Jurisprudence*. See also articles on the various branches of law, e.g. *Canon*; *Ecclesiastical*; *International*; *Roman*; and the biographies of great lawyers and lawgivers, British and foreign, e.g. *Eldon*; *Grotius*; *Justinian*

As a general term, law has several meanings and does not admit of exact definition. In a wide juristic sense it may be defined as the sum of the rules by which the actions of men living in society are governed: or a body of rules set by one or more persons, who have power to impose them, to another person or persons whose duty it is to obey.

From this conception must be distinguished a figurative and non-juristic use of the term arising out of the world of physical pheno-

mena. We find the word law employed to express the idea of order, or cause and effect, or the apparently immutable sequence of events in nature.

DIVISIONS OF LAW. In a stricter juridical sense than these, however, law means the totality of rules, emanating from various sources, actually realized and enforceable in any organized and independent state. It involves the idea of a set of rules prescribed by a political superior to an inferior. It is, as such, often called positive law

—“sovereign law, the state’s appointed will.” But from this positive law should first be distinguished certain so-called laws which, though falling under the two definitions above given, do not fit the present one except by analogy. They may be classed as threefold, viz. (a) divine law, (b) moral or ethical law, and (c) law of nature.

By divine law is meant the precepts of God to man revealed either directly or indirectly. They vary among different nations according to the character of the revelation. To those who do not admit the existence of a divine Providence interested in human affairs, such law is non-existent. On the other hand, such law may be accepted by a people as binding on them in part or in entirety, and it then becomes so far their positive or civil law. Such was notably, and to a large extent still is, the position of Mahomedan countries; the Koran, professedly revealed to Mahomet by God, contains a great part of Mahomedan law. Otherwise divine law, not being enforceable by human tribunals, is not positive law.

By ethical law is meant the rules of good conduct and moral behaviour which prevail in a nation or among classes in a nation. Some may be universal and permanent in character, but for the most part they vary infinitely, and are constantly changing with time and circumstance. Ethics, too, may be a material basis of positive law.

It may be observed regarding both divine and ethical law that in primitive communities they can hardly be distinguished from law proper, but gradually, as society progresses, they become differentiated from it. Early Roman law affords an example. *Jus, fas, and boni mores* (human law, divine law and good conduct), were at first, though in terminology distinct, bound up together in practice, in many matters almost inextricably.

Common Sense and Civilization

By natural law is meant the dictates of reason or common sense, good faith, sense of justice, equity or the like, such as they are revealed to cultured people everywhere by their reasoning faculties. It is not the conceptions of primitive man in a state of nature, but of the civilized races that this law indicates. It was known to the Romans by the names both of *jus gentium* and *jus naturale*, though both of these terms had also other meanings—the former being applied in a narrower sense to an ideal law applicable to foreigners and Roman citizens alike, originating in practical expediency, and the latter

being used as law governing the actions of all animate creatures. *Jus gentium* or *naturale* in the sense here given was conceived by the philosophising Roman jurists of the late republic and early empire as an ideal, and has deeply influenced modern law. It is defined by Gaius, under the name *jus gentium*, as that which natural reason has established among all mankind. This definition, probably borrowed by Gaius from some earlier philosopher who was thinking only of *jus naturale*, has never been bettered, despite many and lengthy discussions on the subject by medieval and modern writers.

Character of Natural Law

About its character, however, there is at present no sort of agreement. It has been sometimes identified by theological writers with divine law, while some writers of the positivist school go so far as to deny its existence altogether. Its authority was greatest in the 17th and 18th centuries. In particular, international law was mainly based on it by Grotius and his successors, while Locke, Rousseau, and others deduced from it theories of the origin of the state as resting on a social compact, which is now exploded as inconsistent with history. But that natural law exists and expresses itself under the names of reason, justice, good sense, equity, or the like, seems as legitimate a proposition as that moral law exists. Its existence and authority are so far proved by the fact, for instance, that natural rights are, and constantly have been, founded upon it, not only in popular language, but in judicial proceedings. Thus in England, in medieval plaints before the king’s council and other courts not of common law, we find constant appeals to “bon foy” and “raison” and the like as the basis of their jurisdiction. So when it is laid down by English judges that a particular custom, in order to receive effect, must be reasonable, this seems tantamount to saying that it must be in accordance with natural law.

Nevertheless, the distinction between it and ethics is often hard to draw, and some writers on jurisprudence incline to identify them. In the concrete they often reach the same result. Nor can it well be said of the principles of either of them that they are unchangeable. However, there is a clear distinction in their respective objects—that of ethics being virtue, that of natural law being liberty. It may be instructive to give an illustration of the difficulty of this matter. It is and has been the law of England for many generations that an eldest

son succeeds on intestacy to his father’s lands, to the exclusion of all other children. It is a rule fixed by custom, as apparently no statute or judicial decision expressly laid it down. Is it obnoxious to natural law? or prescribed by it? or simply indifferent to it? In the Middle Ages, when the tenure of lands was military, it was a useful rule, and almost necessary for the preservation of lands in a family, and if utility can be taken as a test of natural law, then it was in conformity with it. But in recent times, owing to changes in the conditions of life and property, it has lost its value; most people hold it to be unjust, and it has been abolished in most countries.

But however this be, it is certain that natural law does not constitute a body of law in the strict juristic sense, seeing that it claims to be universal in its ambit, and is incapable of being collected or completely realized either in time or space. It is therefore law only analogically. It is an aggregation of principles rather than a body of rules. It is only when adopted by a legislator or by custom or other constituent element of law within a state that it becomes positive law.

ANALYSIS OF POSITIVE LAW. As to positive law, regarded analytically from the point of view of jurisprudence, it has been analysed in the abstract as the command of a sovereign. This, in particular, is the view of Hobbes, Austin, and their followers. It is based on the hypothesis that law cannot exist in the concrete without some power to enforce it, and such power must be vested in some definite person or body of persons who is sovereign, i.e. common superior. Every law must have a sanction, and this sanction properly consists in some punishment inflicted upon, or detrimental to, the law-breaker.

Positive Law and Government

This analysis, though it may be perhaps accepted as fitting the conditions of modern independent states, has been objected to with reason on various grounds. The notion that a sovereign in the sense of a definite ruler is required for law is objectionable; political sovereignty, for one thing, may well be divided between several persons. Nor in insisting upon the element of command does this doctrine properly allow for the fact that many laws are permissive and declaratory in character, and that there are and always have been communities governed wholly or mainly by pure customary law. To hold that custom does not become law till its validity is

declared by a judge, is to make the judges legislators, which is what they profess not to be.

Nor, even if adequate in general as regards private rights and duties, is the Austinian theory satisfactory in accounting for public or constitutional law. Nor does it admit the existence, strictly speaking, of international law, seeing that in the family of nations there is no common sovereign, but relegates it to the domain of ethics or natural law.

Without entering further into an analysis of its elements in the abstract, we can say of positive law that it has the quality of an organism, capable of growth and full evolution, and as such, where not interfered with by extraneous influences, expresses at all times the characteristics of the community in which it exists. In other words, it represents the general state of culture of the people who observe it. It may not always march *pari passu* with that culture; sometimes it lags behind it, but it is always representative of it.

PRIMITIVE LAW. The historical method of inquiry into the evolution of positive law is the only one which can lead to satisfactory results. It is a remark as old as Confucius that in order to understand the present we must study the past. Among primitive and semi-cultured peoples almost all law is based on custom. It is patriarchal, tribal, and sacerdotal. All studies in comparative law tend to prove this. The hereditary traditions from common ancestors and the tribal habits of life are persistently followed by the members of the community, while the terror of the gods acting on naturally superstitious minds forms a powerful sanction, and secures their permanence.

Features of Early Law

Where breaches of the customs take place, despite the fear of the gods, they are usually punished, if inexpiable by an offering to the gods or injured party, either by extrusion from the tribe (excommunication), which involves generally for the delinquent death or slavery, or else by regulated self-help or revenge by the injured party or his kinsmen upon the wrongdoer. The notion of retaliation (*talio*), in particular, which involves a strict proportion in punishment, early makes its appearance in the history of law, and interesting survivals of it may be found even to-day.

Another feature of early customary law is its formalism. The customs are by no means loose and ill-defined. One might expect,

perhaps, the opposite, but strict observance of the recognized forms was insisted on; they had the sanction of superstitious reverence. Formal words and gestures were of the essence of most transactions. For example, the conveyance by mancipatio in sales of slaves and cattle, used by the Romans from the earliest times, was characterised by formal words and gestures and other requirements, failure to observe any one of which was fatal to the whole transaction without regard to whether the price had already been paid to the mancipient (seller) or the object delivered to the buyer or not. The ritual was framed by the pontiffs and must be exactly observed.

But in a progressive community settled customs do not long suffice for the wants of the people, and the next step seems to have been everywhere resort to legislation, i.e. the making of direct ordinances or decrees by the ruler or, later, by the people themselves, which are put in writing and become obligatory on the whole community. Such legislation, however, is at first small in bulk. The enactments are brief and in imperative words, and mostly of a penal character.

Early Codes of Law

An interesting feature is the fact that the customs and ordinances were early collected and made public in the form of codes or books. The object of this was, not as in modern codes, to unify divergent doctrines and rules, or to produce a simplified and systematic body of law out of superabundant material, but to make the laws known to the citizens. Several of these codes have come down to us in more or less fragmentary form. Such are the Code of Hammurabi, the Laws of Manu, the Laws of Moses, the Salic Law, and the XII Tables. Of these the last is perhaps the most characteristic. It was regarded by later Romans as the perfecting of their old *jus civile* for all citizens (*finis aequi juris*, as Tacitus puts it), and, at the same time, as the foundation or matrix from which all their later law flowed forth (*fons omnis publici privatique juris*, as Livy has it). The XII Tables were always kept in view in all subsequent changes in the Roman law. None of its provisions was ever formally repealed, though almost every one of them was superseded or rendered obsolete long before the time of Justinian.

But once legislation has begun, and especially when codes such as those just mentioned have been enacted, the tendency is for

custom to become much less active as a law-producing factor. Interpretation of and commentaries upon the *leges* take its place in large measure. At first such interpretation is apt to be narrow and casuistic, and becomes of itself part of the strict common law. But gradually in a progressive state, through the influence of commerce and intercourse with foreign nations, ideas of equity and *jus gentium* assert themselves, and the spirit of the law is often allowed to prevail over its letter, and to supply deficiencies in and make corrections on the common law where it was found out of harmony with the prevailing ideas of the community.

Use of Legal Fictions

We find that this was mainly effected by the action of the magistrates and judges in their control of procedure. They did so by means of legal fictions, actions of analogy adapted to the case, equitable exceptions, and the like. This at last was what happened in the history of both the Roman and the English law, from one or other of which nearly all modern European systems of law have been derived. In Rome it was primarily the praetors, in England it was the chancellors who produced this result. In both countries a system of equity was built up alongside the strict common law (*jus civile*).

But as a state progresses there tends to become a plethora of laws; for although new customs are few, nevertheless statutes, judicial decisions, and commentaries on them by jurists, increase enormously, so that the law tends to be overwhelmed by superabundance of material. Extensions of territory, too, on the part of a nation bring new laws into force within the state and conflicts of laws take place. A remedy for this is sought in codification.

The first important effort in this direction was made by Justinian in the years A.D. 529-534. By his works, the Code, the Pandects, and the Institutes, forming what is known to moderns as the Corpus Juris Civilis, he digested and reduced to symmetry the vast mass of statute and common law which bewildered the courts and hindered justice before his time. It may be observed as an interesting fact that at a short interval before Justinian's collection, were published the so-called Salic Law of the Franks, and the Riparian and Burgundian Codes, presenting us with a comparison of codes

prepared at the culmination and the beginning respectively of the evolution of systems of law.

The extension of territory by a nation through conquest or otherwise, or the mixture by union of two or more nations, necessarily affects their laws as it does their ethics. The new conceptions introduced may not only modify but even sometimes entirely overthrow the native customs and rules of the conquering or conquered state. The barbarian tribes that partitioned the shattered Roman Empire in Western Europe, having at first to adopt and apply the Roman law to their Roman subjects, soon experienced its dominating influence over their own rude and uncultivated institutions. It checked and altered to an immense extent the natural evolution of their own native law. The compilations of Justinian, indeed, had at first little influence, and, in fact, were hardly known in Western Europe during the Dark Ages, but time brought a great revenge. From the end of the 11th century, when the teaching of the Pandects began at Bologna, down to the 17th century, the Roman law asserted its influence to an immense extent in all the independent states that had grown up in the West. Except in England, where for certain causes it failed to prevail over the common law, it became the potent factor in the evolution of the jurisprudence of these states. It was received by most of them as their common law—*ius receptum*. But it gave rise to many contraries and difficulties in assimilation.

Modern Codifications

The French Code Napoléon of the beginning of the 19th century was enacted mainly with the object of harmonising the contraries arising from the rules of the Roman law and old native customary law (*droit écrit* and *droit coutumier*), and on this the codes of all the Latin states have since been based. The modern Teutonic codes, also, of which the German Bürgerliches Gesetzbuch of 1900 is the shining exemplar, contain an immense amount of Roman law. But evolution of a country's laws does not end with a code; the actions of men are in constant flux and change; a code merely forms a simple and definite statement of pre-existing law in the form of an enactment, and it needs to be periodically revised.

The divisions of law are numerous, depending upon the point of view from which it is envisaged. The primary division is into

national and international. National law, again, has varied subdivisions, e.g. public and private, civil and criminal, civil and ecclesiastical. These branches are dealt with in separate articles.

Bibliography. Lectures on Jurisprudence, J. Austin, ed. R. Campbell, 1869; The Common Law, O. W. Holmes, jun., 1887; Theory of Legislation, J. Bentham, 8th ed., 1894; Studies in History and Jurisprudence, Lord Bryce, 1901; Law and Public Opinion in England, A. V. Dicey, 2nd ed., 1914; Nature of the Judicial Process, B. N. Cardozo, 1921; Outlines of Historical Jurisprudence, Sir P. Vinogradoff, 1922; Interpretations of Legal History, R. Pound, 1923; Ancient Law, Sir H. Maine, ed. Pollock, 1924; Jurisprudence, T. E. Holland, 13th ed., 1924; First Book of Jurisprudence, Sir F. Pollock, 6th ed., 1929; Modern Theories of Law, W. I. Jennings, ed., 1933; Readings in Jurisprudence, J. Hall, ed., 1938; Legal Theory, W. Friedmann, 2nd ed., 1947; Law in the Making, C. K. Allen, 4th ed., 1946; Jurisprudence, G. W. Paton, 1946; Jurisprudence, Sir John Salmond, 10th ed., 1947.

Law. In natural science, the invariable relation between phenomena. In similar conditions similar results will always occur. These so-called laws of nature have no independent existence of their own, as is sometimes asserted, and are not independent forces anterior to things; they are themselves conditioned by things and the connexion of things. Further, their value is only hypothetical—if such conditions are present, then such results will happen. They are limitations which, under the direction of experience, we ourselves prescribe for experience. They constitute the sum of the methods invented for appropriating the things of nature and bringing them under control.

In chemistry, a periodic law is a system of classifying the elements into groups possessing similar chemical properties. See Induction; Periodic Law.

Law, ANDREW BONAR (1858–1923). British statesman. Born in New Brunswick, Canada, Sept. 16, 1858, son of a Presbyterian minister, he passed his earliest years in that province, but completed his education at the High School, Glasgow. Entering the iron trade, he became a partner in W.



A. Bonar Law,
British statesman

Kidston & Sons and in W. Jacks and Co. In 1900 he was elected Unionist M.P. for the Blackfriars division of Glasgow. In the commons he gained a reputation as a speaker, especially on business matters, and in 1902 became parl. sec. to the board of trade. The tariff reform issue, which he supported, gave him further opportunity. He lost his seat in the Unionist débacle of 1906, but was soon returned for Dulwich. In 1910 he undertook to fight the free trade stronghold of N.W. Manchester, but was defeated. Returned for Bootle in a by-election early in 1911, he remained its member until 1918, when he became again a representative of Glasgow, this time of the Central division.

Leader of the Unionists

In 1911, on the resignation of Balfour as Unionist leader, Bonar Law was a surprising but unanimous choice as his successor, being a compromise acceptable to the supporters of two more obvious but irreconcilable candidates, Austen Chamberlain and Sir Walter Long. As leader of the opposition, it fell to Law in 1914 to assure Asquith of the support of the Unionist party in the event of war. When war came, the promised support was given, and on the formation of the first coalition ministry in 1915 Law had a voice in its composition, he himself taking the office of colonial secretary. At the time of the cabinet dissensions of Dec., 1916, Bonar Law threw in his lot with Lloyd George. When Asquith resigned, the king invited him to form a government, but he declined, preferring to support Lloyd George as premier. Lloyd George appointed him chancellor of the exchequer, leader of the house, and a member of the war cabinet.

In 1918 he and Lloyd George presented themselves as joint leaders of a proposed continuance of the coalition, and were returned to power, Bonar Law becoming lord privy seal, though remaining leader of the house. He was one of the British delegates to the Paris peace conference, 1919. In March, 1921, his health gave way, and he resigned. But in 1922 he had recovered sufficiently to take a leading part in destroying the coalition he had formerly led, and at the subsequent election was returned as head of a Conservative govt. on a programme of "tranquillity." His premiership, however, lasted only a few months, for ill health caused his resignation the following May, and he died

Oct. 30, 1923. He was buried in Westminster Abbey.

Never a great popular figure, he was remarkable for his sound grasp of the details of finance and statistics, and his shrewd counsel was of great service throughout a critical period. He was lord rector of Glasgow university from 1919 onwards. Ashridge Park (*q.v.*) was presented to the Conservative party in 1928 as a memorial to him. *Consult* The Strange Case of Andrew Bonar Law, H. A. Taylor, 1932.

Law, JOHN (1671-1729). Scottish financier. Born April 21, 1671, the son of a wealthy goldsmith, he went to London in 1688. Nine years later he was sentenced to death for killing his opponent in a duel; but the sentence was soon commuted, and he escaped to Amsterdam. He studied continental finance, and unsuccessfully submitted to the Scottish parliament a project for a land bank, notes issued to be backed by the value of state lands. In 1716 he was befriended by the duke of Orléans, regent of France. French finance was in a chaotic state, and Law and his brother William (1675-1752) started a bank, known first as the Banque Générale and later as the Banque Royale, which issued notes on the royal revenue and landed security. This was the first bank founded in France.

In 1717 Law formed a company having the monopoly of trade with the Mississippi; and in 1720 he became controller-general of French finances. But that year the combined bank and company failed, owing mainly to enormously excessive paper issues (for which the regent was responsible) and to a frenzy of speculation in the company. A contributory cause was the founder's ban on specie. Driven from France, Law went first to England and later to Italy, dying in Venice, March 21, 1729. *See* Mississippi Scheme.

Law, RICHARD KIDSTON (b. 1901). British politician. Son of Andrew Bonar Law (*q.v.*), he was educated at Shrewsbury and St. John's College, Oxford. Having been on the editorial staff of the *Morning Post*, 1927, and the *New York Herald Tribune*, 1928, he entered politics, representing S.W. Hull as Unionist M.P., 1931-45. He was under-secretary at the foreign office, 1941-43; minister of state, 1943-45; and minister of education, 1945. Elected by S. Kensington at a by-election, 1945, he returned in 1950 to Hull as M.P. for Haltemprice.

Law, WILLIAM (1686-1761). An English divine. He was born at King's Cliffe, Northants, and educated at Emmanuel College, Cambridge, where he became a fellow. Ordained in 1711, he refused to swear allegiance to the house of Hanover, remaining a non-juror (*q.v.*) to his death. His fellowship was suspended, and after twelve years spent in the house of Gibbon, father of the historian, he retired to King's Cliffe, 1740, and devoted himself to works of practical piety until his death, April 9, 1761. An inspirer of the Evangelical revival, he wrote his most celebrated work, *A Serious Call to a Devout and Holy Life*, in 1728. In 1737 he became a disciple of the German mystic Jakob Boehme (*q.v.*). The *Spirit of Prayer*, 1748, and *The Spirit of Love*, 1752, express his mysticism. *Consult* his *Collected Works*, 9 vols., 1762, repr. 1892; *Life*, J. H. Overton, 1881.

Law Courts. English name for the central courts of justice which form a feature of all great cities. Examples are the Royal Courts of Justice in London, and the Palais de Justice in Paris and Brussels. The London building is the headquarters of the administration of justice in England. On the N. side of the Strand, bounded E. by Bell Yard, W. by Clement's Inn, and N. by Carey Street, the site covers about $5\frac{1}{2}$ acres. The architecture is composite, Gothic style predominating.

The main building was begun in 1874, from designs by G. E. Street, was opened by Queen Victoria, Dec. 4, 1882, and the business of the supreme court, created 1873-76, was transferred here. The site cost £1,450,000, the buildings about £1,000,000. Including the four added in 1913, from designs by Sir H. Tanner, there are 23 courts and 1,100 rooms. *See* Architecture *illus.*

Lawes, HENRY (1595-1662). An English composer. Son of Thomas Lawes (d. 1640), possibly vicar-choral of Salisbury cathedral, he was born at Dinton, Wilts. Becoming a gentleman of the chapel royal, 1626, he began to compose music for masques, including that of *Comus* by Milton; published settings for paraphrases of the psalms, 1637; and put to music some of Herrick's and Cartwright's poems. Three volumes of *Ayres and Dialogues*, 1652-58, were his last publications. He died Oct. 21, 1662, and was buried in Westminster Abbey. Milton addressed to him a famous sonnet.

Lawes, SIR JOHN BENNETT (1814-1900). British agriculturist. Born at Rothamsted, Dec. 28, 1814, he was educated at Eton and Brasenose College, Oxford. On the Rothamsted estate in Herts, which he inherited in 1822, he began those agricultural experiments which, with Sir J. H. Gilbert, he carried on for over 50 years. In 1899 he founded the Lawes Agricultural Trust to manage the experimental station at Rothamsted. In 1854 he became an F.R.S., and in 1882 he was created a baronet. He died Aug. 31, 1900. *See* Rothamsted.

Lawfeldt. Village of Belgium, also known as Laffeldt and Laufeldt. It is near Maestricht, and is famous for the battle fought here, on July 2, 1747, between Great Britain and her allies and the French. The coalition of which Great Britain and Austria were members was fighting France and Prussia. A French army under Marshal Saxe was threatening the fortress of Maestricht which commanded the Meuse (Maas) valley, and to relieve it the duke of Cumberland and the prince of Orange hurried up.

The French stood to fight on the height of Heedeeren, and opposed to them were the Austrians on the right, the Dutch in the centre, and the British and Germans on the left. The French directed their main attack on Lawfeldt, where the British and the Germans were, but took it only after six assaults. Meanwhile the Austrians were hardly engaged, while the Dutch cavalry fled. Some British cavalry under Ligonier checked the victorious French horsemen for a time, but the French victory was decisive. The losses were about 8,000 on each side. In number the French were superior—125,000 to 90,000.

Law List. A list of judges, barristers, solicitors, and officials connected with the law. It is published annually by the authority of the Commissioners of Inland Revenue and of the Law Society. By the Solicitors Act, 1932, a person whose name appears in the list as being a solicitor holding a practising certificate is presumed to be such a person until the contrary is proved.

Law Lord. Name given in the U.K. to those members of the house of lords who act as lords of appeal. The ordinary lords are nine in number, each receiving a salary of £6,000 a year, and are lawyers who have held some high legal office, either as judge or law

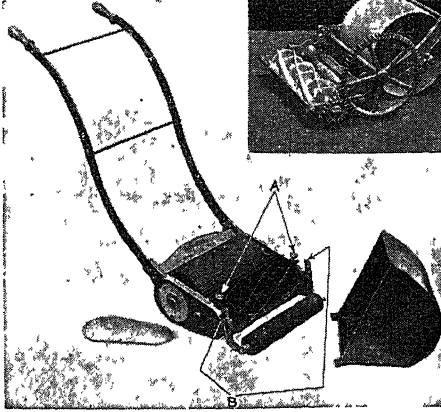
officer of the crown. Each is made a life peer on his appointment, and as such is a regular member of the house of lords, while his children bear the prefix honourable. In addition to the nine, the lord chancellor and any other peers who have held that or any other high judicial office are law lords. Members of the court of session in Scotland are given the title of lord for life, but they are not members of the house of lords. See Appeal, Courts of; Lords, House of; Session, Court of.

Law Merchant (Lat. *lex mercatoria*). Branch of law regulating commercial transactions. It is based upon the general customs which obtain in all commercial countries, and, though different from the general rules of the English common law, is engrafted into it and made part of it, and, for the benefit of trade, allowed to be of the utmost validity in all commercial transactions.

Lawn. Level expanse of turf or greensward intended for ornament or pleasure. A lawn is made by laying turf or sowing grass seeds. The latter way is less expensive and usually more satisfactory, though it does not provide a lawn fit for use so quickly. Turf free from weeds and coarse grass may be laid in autumn, early spring, or in mild weather in winter. The best times to sow seeds are in cool weather in Aug.-Sept., or in April. The site must be dug over and perennial weeds removed; the ground is levelled, raked to remove stones, and rolled in both directions. Turves are laid so that the end of one is opposite the centre of the next.

Two oz. of seed to the sq. yd. is enough to ensure a thick sward. When sown, it is covered with a little sifted soil or raked over lightly. Rolling when the soil is dry will complete the work. The first cutting is done with a scythe or with the blades of the machine set high. Lawns should be raked when dry in winter to remove moss, swept and rolled occasionally, and mown once a week in summer. Application of sand in autumn and spring will destroy weeds. Seed mixtures containing rye-grass make a coarser sward than others

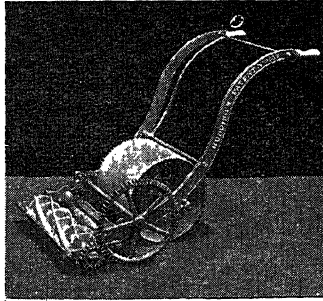
Lawn. Fine linen, sometimes cotton, fabric, used for dress



Lawn Mower. Modern machine by Ransome: A, screws controlling cutting cylinder; B, roller regulating height of cut. Top picture, Budding's original machine

material and handkerchiefs, etc. Bishops' sleeves are made of lawn, and the word is sometimes used to denote the office of a bishop. In porcelain and cement making the lawn, or lawn sieve, is a fine strainer usually made of silk. The word lawn, long derived from French *linon*, through *lin* (flax, linen), is now thought to come from Laon, which once had large linen manufactures. See Linen.

Lawn Mower. Device invented by Edwin Budding in 1830. Two years later the Zoological Gardens,



London, used a machine made by Ransomes of Ipswich. There are two types today: back-roller drive and side-wheel drive. In the back-roller type the frame is of iron or aluminium castings or steel plate, mounted on a roller in two sections and fitted with handles for propulsion. The reel or cylinder has blades or cutters, is fitted

parallel with and in front of the roller, and is driven by chain gear or toothed wheels fixed on the roller and the cylinder spindles. Against a fixed blade under the machine, the revolving cylinder cuts. Motor and electric mowers are usually of this type.

The side-wheel type, patented 1869, has a frame and cutting cylinder with wooden handle for propulsion. The drive is taken from a ground wheel on each side with internal teeth which engage in toothed pinions on the cylinder spindle. A small wooden roller at the rear adjusts height of cut.

In the back-roller type, the cutting cylinder is adjusted to the fixed bottom blade by screws (A in illus.) on each frame operating on a spring-loaded bearing, or to a rocking bottom blade controlled by a central screw. The height of cut is regulated by the front roller from one side or both (B in illus.). The cylinder of the other type is similarly adjusted, but the rocking bottom blade is controlled by screws at the sides.

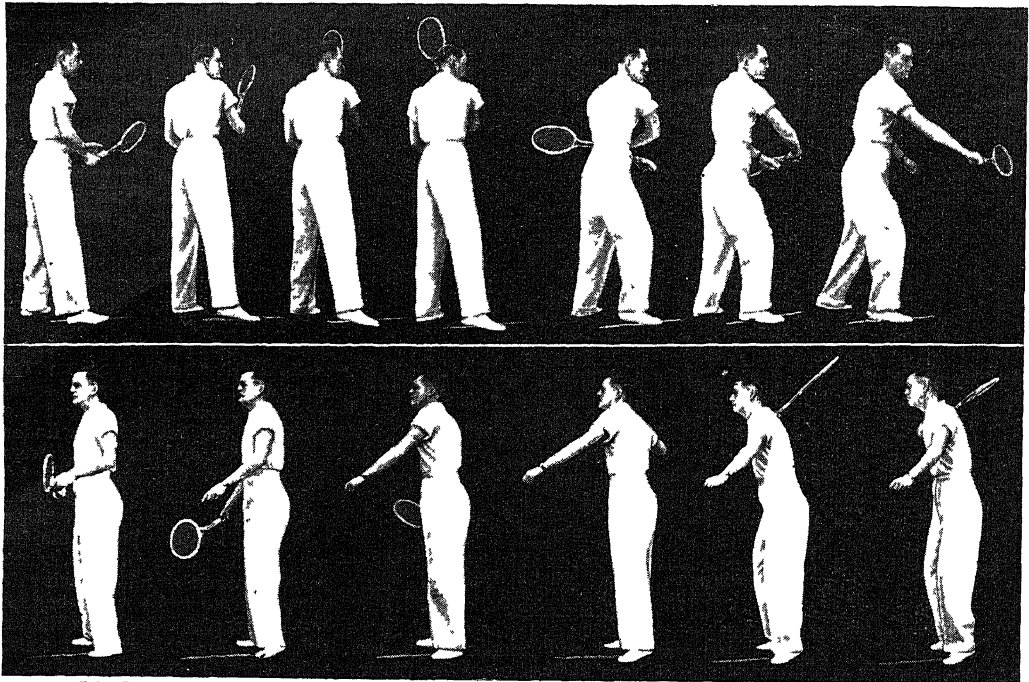
LAWN TENNIS: THE GAME AND ITS HISTORY

H. B. T. Wakelam, Radio Sports Commentator

The origins of lawn tennis, its government and rules, and some of its notable personalities are here recorded. For the parent game from which lawn tennis probably sprang, see Tennis

It is almost impossible to separate lawn tennis in early records and references from "real" or "royal" tennis, but it seems probable that the lawn game was an offshoot of royal tennis. The first mention of lawn tennis seems to be in a paper called *The Sporting Magazine*, dated Sept. 29, 1793, the correspondent therein recording that "field tennis threatens to bowl out cricket." Eighty years later Major Wingfield, M.V.O., patented his "Sphairistikè"—with an hour-glass court, net sagging to the centre, uncovered rubber balls, and battledore rackets—which was undoubtedly the foundation of lawn tennis.

In 1875 lawn tennis was introduced at the All-England croquet club at Wimbledon, the first men's championship, held there in 1877, being won by S. W. Gore. The first women's championship, won by Miss M. Watson, was held at Wimbledon in 1884. In 1888, the Lawn Tennis association was founded. The Americans took up the game, and it gradually grew in popularity on both sides of the Atlantic. In 1900 an American, D. F. Davis, himself a player of considerable skill, presented the Davis cup—more correctly the Dwight Davis international bowl—to be played for by such nations as cared to enter. The match play in this consists of four men's



LAWN TENNIS. L. A. GODFREE DEMONSTRATING THE BACKHAND DRIVE (TOP ROW)—

Reproduced by permission from *Lawn Tennis*, by L. A. Godfree—

singles and one men's doubles. The nearest women's counterpart, the Wightman cup, inaugurated 1923, is played for only between Great Britain and the U.S.A. and consists of five singles and two doubles.

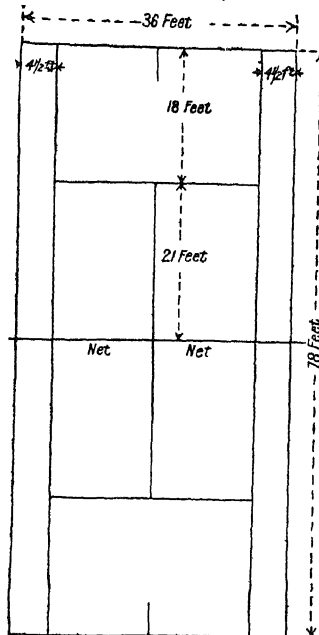
The Davis cup records are perhaps the best guide to the growth in popularity of lawn tennis. From 1900 to 1903, it was competed for only by Great Britain and the U.S.A.; in 1905 Australasia, Austria, Belgium, and France entered, by 1914 Canada and Germany, and by 1939 41 countries had been in the lists. Up to 1914 this growth of popularity was gradual and steady. After the First Great War there came a boom, a large share in which must be put down to the amazing French girl, Suzanne Lenglen: she won the ladies' singles championship six times, the ladies' doubles six times, and the mixed doubles three times, displaying wonderful agility and courtcraft; and she revolutionised women's tennis dress.

Lawn tennis has produced many personalities. The Renshaw twins in the early volleying days; those great British strategists C. P. Dixon and H. Roper Barrett; A. F. Wilding and N. E. Brooks from New Zealand and Australia respectively; and M. E. McLoughlin, U.S.A., were great pre-1914 names. Outstanding players from

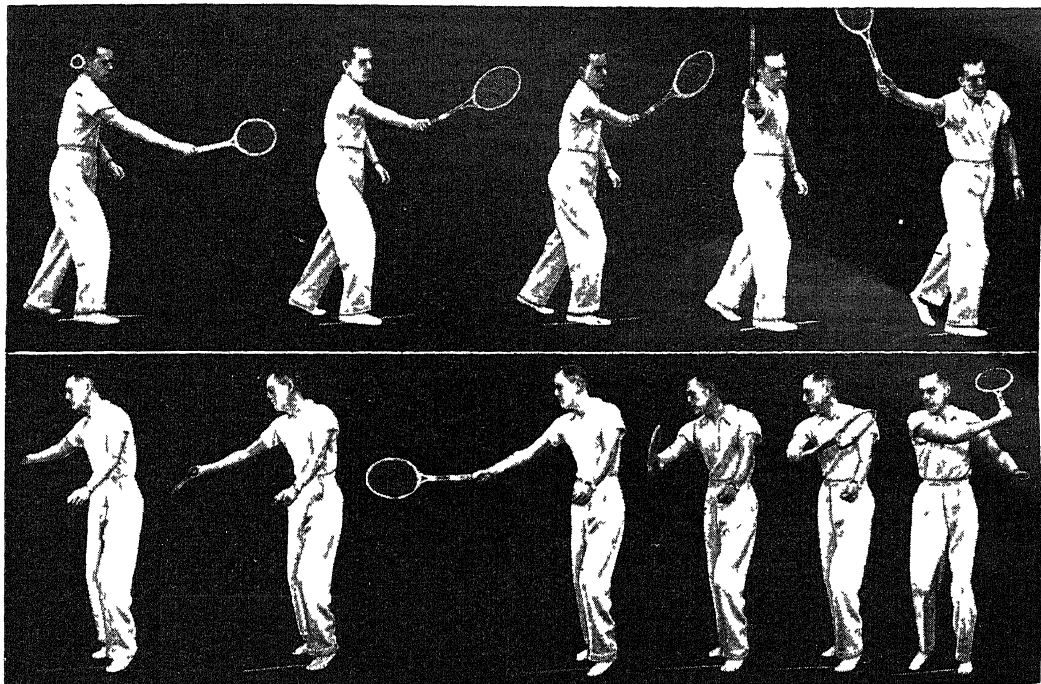
1919 onwards include W. T. Tilden, the tall American with his cannon-ball service and profound knowledge of the game; the four Frenchmen, R. Lacoste, J. Borotra,

H. Cochet, and J. Brugnon, popularly called the "Four Musketeers"; the Australian J. H. Crawford; the Americans H. E. Vines and D. Budge; and the British F. J. Perry; among women Helen Wills Moody (U.S.A.), who was almost in the Lenglen class as a draw, and Elizabeth Ryan of California, perhaps the greatest of all women's doubles players, must be mentioned.

THE GAME. Lawn tennis can be played as either a singles game between two opponents or a doubles between two pairs of partners. It consists of striking a rubber ball, covered with cloth, backwards and forwards over a net strung across a court of certain marked confines (see plan), each player using a racket for this purpose. The court can be of grass, wood, or any other hard, level, true surface. The court is divided in the middle by the net, which is 3 ft. high at the centre and 3 ft. 6 inches at the posts, which are 3 ft. outside the court. The balls used are of 2½ ins. diam. and 2 oz. weight and have a standardised bounce. Rackets, though usually of a standardised dimension, can be varied to suit individuals. As a rule they have a wooden frame and handle and are tightly strung horizontally and vertically with interlaced gut.



Lawn Tennis. Plan of court marked out for four players; for two players the court is as shown without the 4½ ft. extensions on each side



—AND THE FOREHAND VOLLEY (BOTTOM ROW OF PICTURES)

—and H. B. T. Wakelam; J. M. Dent & Sons, London, 1937

The opponents toss for service and choice of sides. The server, at the moment of delivering the service, must stand outside the court between imaginary continuations of the side and half-court lines, and serve from the right and left courts alternately into the diagonally opposite half of the opposite service court. A service which touches the net if otherwise good is called a let, and does not count. Any breach of the service law is a fault, and two faults lose the server the point. The player receiving the service may not volley it, but has the whole of the opposite court into which he may return it. When the service has been delivered the ball is in play, and thereafter any player hitting the ball into the net or out of court loses the stroke. On the line counts in, for either service or return. Scoring is by strokes—love, fifteen, thirty, forty, game. Forty all is deuce, and the next stroke vantage; if the vantage player then wins the next stroke, he wins the game; if not, the score goes back to deuce; the scoring being adapted from that in use in royal tennis. At the end of a game the service passes to the opponent. The first player to reach six games wins the set, unless before that happens the score reaches five all. At five games all,

vantage games are played, the first side to get two clear games, e.g. 7—5, 8—6, 9—7, winning the set. A men's match usually consists of five sets, a women's of three.

Opponents in matches change ends after the first, third, and every subsequent odd game of each set, and also at the end of each set if the total number of games in the set is uneven, viz. 6—1, 6—3. If this total is even, viz. 6—0, 6—2, etc., the change takes place after the first game of the next set. This is to neutralise, as far as possible, such local disadvantages as may be caused by strong wind, sun in the eyes, and so on.

In the original laying down of a tennis court great care should be taken to site it correctly according to the path of the sun. In the U.K., for afternoon or evening play, a court running N.W.—S.E. is advantageous. Sufficient space at each side of the court should also be allowed for, as well as the run-back (about 20 ft.) at each end.

The management of lawn tennis in Great Britain is vested in the Lawn Tennis association (L.T.A.). This association, with its affiliated bodies, covers not only the general run of organized lawn tennis in England, Scotland, and Wales, but also has in its constitution representatives from empire and foreign country associations. The

Wimbledon championships—the “blue riband” of tennis—are run by the All-England lawn tennis and croquet club, Wimbledon, which is affiliated to the L.T.A.

The L.T.A. hq. is at River Plate House, Finsbury Circus, London, E.C.2. Its yearly handbook gives a survey of the game and complete details of rules and regulations, tournament management, etc.

A world organization, the International Lawn Tennis federation, covers the affairs of amateur lawn tennis throughout the world. Both Davis and Wightman cup matches have their own regulations.

An amateur lawn tennis player is one who is not disqualified as an amateur in any other branch of sport, and who does not receive, or has not received directly or indirectly, pecuniary advantage by the playing, teaching, demonstrating, or pursuit of the game of lawn tennis. This last ruling is qualified in favour of those on the staff of educational establishments. They may coach pupils at tennis as well as carrying out scholastic or routine duties, provided they do not receive any specific part of their salary on account of tennis instruction.

Professionalism has increased since the First Great War. Many players of both sexes, after winning renown as amateurs, have gone

to the professional ranks in order to join for financial gain the "circuses" which, especially in the U.S.A., travel around the big centres playing series of exhibition matches and drawing big gates. Some countries have recognized professional championships.

Any would-be player must procure a good, well-balanced racket of suitable weight and handle-girth. Expert advice is almost always obtainable. Comfortable, well-fitting shoes are necessary, for tennis depends very much on speed of foot. Dress should be loose-fitting. From the original base-line game, through the days of intensive net-storming volleying, another style, a combination of both these styles and known as the all-court game, was evolved. It required extreme mobility and constant activity. A faulty shoe-lace or an ill-fitting waist-band might easily prove a handicap. *Consult Lawn Tennis Handbook* (annually); *Lawn Tennis*, Godfree and Wakelam, 1937.

Law Officer. A term used in the U.K. for those members of the government who look after its legal business. These are the attorney-general and the solicitor-general for England, and the lord-advocate and the solicitor-general for Scotland. Usually they are members of the house of commons. *See Attorney-General; Lord Advocate; Solicitor-General.*

Law of Property Acts. Name applied to a series of Acts of Parliament passed in 1925 which simplified conveyancing of land and made extensive changes in the law of succession on intestacy, abolishing primogeniture and other relics of feudal law. The scheme of these acts originated with Lord Birkenhead.

Lawrence. A city of Kansas, U.S.A., the co. seat of Douglas county. On the Kansas river, 41 m. W. of Kansas City, it is served by several rlys. An important educational centre, it is the seat of Kansas university, founded 1866, and Haskell institute, the largest Indian school of the U.S.A. Lawrence is a flourishing commercial city, with flour and paper mills, foundries, machine shops, etc. Founded in 1854 by the Emigrant Aid Society, it was identified with the anti-slavery party. Pop. 14,390.

Lawrence. City of Massachusetts, U.S.A., co. seat of Essex co. On the Merrimack river, 30 m. up from its mouth, it is 25 m. N.N.W. of Boston and is served by the Boston and Maine rly. and

an airport. Lawrence, the state's only "made" city, was established in 1845 by the Essex co., Boston financiers and merchants, to utilise power from the Merrimack rapids on a site which included 17th cent. Methuen and Andover. The co. built a granite dam and brought in immigrant workers. By 1890, 45 languages were spoken here, the largest segment of the foreign-born white pop., today 27.2 p.c., being Italian. Here is the world's largest woollen mill and largest printing works. Lawrence, which looks as though it had been constructed purposefully, was incorporated in 1847 and became a city 1853. Pop. 84,323, with a metropolitan area pop. of 334,969.

Lawrence. Saint and martyr. Probably born in Spain, he was educated in Rome. He was ordained deacon about 257, but was soon put to death, probably in 258. The story is that, when serving as treasurer of the church in Rome, he was ordered to produce the valuables in his charge, whereupon he showed the official a number of beggars and for this was sentenced to death. He was roasted on a gridiron, and this implement is always shown with figures of the saint. S. Ambrose also tells how when burning he said, "I am roasted enough on this side, turn and eat." Many churches are dedicated to S. Lawrence. The Escorial palace was built in his honour, because on his festival, Aug. 10, the Spaniards won the battle of St. Quentin in 1557.

Lawrence, JOHN LAIRD MAIR LAWRENCE, 1ST BARON (1811-79). British administrator. Born at



1st Baron Lawrence, British administrator

Richmond, Yorks, March 4, 1811, he was brother of Sir Henry Lawrence. Educated at Foyle College, Londonderry, and Haileybury, he went to India in 1829, being in the civil service. He was stationed at Delhi, then regarded as the centre of the most restless district in India, and until 1846 acted as magistrate and collector, winning a high reputation for energy and fearlessness. In 1846, after the first Sikh war, which in a civilian capacity he helped to win, he was put in charge of a district between the Indus and Sutlej, just annexed by Great Britain.

In 1849, just after its conquest, Lawrence was made chief commis-

sioner, and later lieutenant-governor, of the Punjab, where he did a great organizing work. When the Mutiny broke out in 1857 his promptness saved the Punjab; he raised an army of Sikhs and was instrumental in capturing Delhi. For his share in the suppression he was made a baronet in 1858 and pensioned. In 1864 he returned to India as governor-general for five years, being made a peer on his retirement. In 1870 he became chairman of the first London School Board. Lawrence died June 27, 1879, and was buried in Westminster Abbey. The barony is still held by his descendants, John Lawrence (b. 1908) having become 4th baron in 1947. *See India; Indian Mutiny; consult Lord Lawrence, L. J. Trotter, 1880; Lives, Bosworth Smith, 1885; Sir R. Temple, 1889; C. U. Aitchison, 1892.*

Lawrence, (ARABELLA) SUSAN (1871-1947). British politician. A Londoner, educated at Newnham,



Susan Lawrence, British politician

Cambridge, she went into politics by way of local government. A member of the London School Board in 1900, she secured election to the L.C.C. in 1910 and was a member until 1928, being deputy-chairman 1925-26. She organized the National Federation of Women Workers, 1912-21. Susan Lawrence was Labour M.P. for East Ham N., 1923-24 and 1926-31, and parliamentary secretary to the ministry of Health in the Labour ministry of 1929-31. On the party's national executive, she was chairman in 1930. She died Oct. 24, 1947.

Lawrence, DAVID HERBERT (1885-1930). British novelist and poet. Son of a coal miner, he was born at Eastwood, Notts, Sept. 11, 1885. Educated at Nottingham high school and university college, he became a clerk, and later a schoolmaster. His first literary efforts were history books under the name of Lawrence D. Davidson. A novel, *The White Peacock*, appeared in 1911, the year his mother died. This year marked a crisis in his life: the demand of



D. H. Lawrence, British novelist and poet

books under the name of Lawrence D. Davidson. A novel, *The White Peacock*, appeared in 1911, the year his mother died. This year marked a crisis in his life: the demand of

affection made upon him by his mother, which he returned with pathological intensity, coloured his mind and influenced his work. It provided the recurrent theme of his third and probably best novel, *Sons and Lovers*, 1913. Lawrence became obsessed by the subject of thwarted passion and enmity between the sexes; he returned to it in *Women in Love*, 1920; *The Ladybird*, 1923; *Lady Chatterley's Lover* (issued in Florence in 1928, but banned in Great Britain except in an expurgated version); *The Woman Who Rode Away*, 1928. His rapid, vivid style, his worship of the strong and vital, influenced many younger writers. He sought to explain his theories in the powerful *Fantasia of the Unconscious*, 1922.

Lawrence travelled much, and his essays contain brilliant descriptions. His sojourn in Mexico resulted in a novel *The Plumed Serpent*, 1926, which showed the impression made upon him by vestiges of Aztec civilization. Although as a poet he showed no appreciation of form, an accuracy of description and fineness of word-painting revealed his breadth of vision and perception of the wonders of natural life. His collected poems were pub. in 1928.

Towards the end of his life Lawrence held a high place in English literature. In a poignant phrase he summed up the tragic conflict of his nature, expressed not only in writing, but in painting and drawing: "My spirit is like a naked nerve on the air." Married in 1914 to Frida von Richthofen, he died at Nice, March 2, 1930. Among biographical studies, *consult* those by H. J. Seligmann, 1924; S. Potter, 1930; R. Aldington, 1930; R. West, 1930; E. & A. Brewster, 1934; *The Savage Pilgrimage*, C. Carswell, 1932; *Son of Woman*, J. Middleton Murry, 1933. Letters, ed. A. Huxley, appeared in 1932.

Lawrence, ERNEST ORLANDO (b. 1901). An American physicist. Born at Canton, S. Dakota, Aug. 8, 1901, he was educated at the universities of S. Dakota, Minnesota, and Yale. Chosen national research fellow in physics at Yale in 1925, he went to the university of California as professor of physics in 1930, and became director of the radiation laboratory there in 1936. An authority on nuclear, biological, and medical physics, he was a pioneer in the development of the cyclotron; his first model, weighing 60 tons, was built in 1928. He also designed a 200-ton cyclotron, and for this and

his work in atomic research was awarded the Nobel prize for physics in 1939, among numbers of honours and awards. Lawrence helped to develop the atomic bomb, and in 1945 was appointed an adviser of the U.S. government on the direction, control, and use of atomic energy in medicine and industry. He conducted experiments in the artificial production of cosmic rays.

Lawrence, SIR GEOFFREY. The British judge at the Nuremberg trials of war criminals took in 1947 the title of Lord Oaksey (*q.v.*).

Lawrence, GERTRUDE (b.1898). British actress. Born in London, July 4, 1898, she appeared in pantomime, 1908, as a child dancer, and was principal dancer in the revue *Some*, 1916. During the 1920s she played leading parts in Charlot's revues and in musical plays in London and New York. Another success was in *Nymph Errant*, 1933. She acted with Noel Coward in *Private Lives*, 1930; *Tonight at 8.30*, 1936. Later Broadway shows included *Susan and God*, 1937; *Lady in the Dark*, 1941; *The Lady Maria*, 1947. She published her reminiscences, *A Star Danced*, 1945.

Lawrence, SIR HENRY MONTGOMERY (1806-1857). A British soldier and administrator. Born



Sir Henry Lawrence,
British soldier

at Metara, Ceylon, June 28, 1806, the brother of Lord Lawrence, he joined the Bengal artillery in 1823. He saw service in the Burmese War, 1824-26, the Afghan War, 1838, and the first and second Sikh Wars. In 1847 he was resident at Lahore, and devoted himself to the reconstruction of the Punjab. When that province was annexed by Dalhousie, Lawrence was appointed president of the board of administration.

Transferred to Rajputana, in 1856 he published two articles protesting against the reduction of British armed strength in India, and his insistence on the danger involved was tragically confirmed when the Indian Mutiny broke out in the following year. Lawrence was at Lucknow at the time, and it fell to him to defend the residency during the siege. This he did for months until, July 2, 1857, he was struck by a shell and died within two days. Lawrence takes rank as one of the noblest charac-

ters in the line of great Anglo-Indian soldiers and administrators. *See* Lucknow, Siege of; *consult* Lives, Sir H. B. Edwardes and H. Merivale, 1872; J. J. M. Innes, 1898; Lawrence of Lucknow, J. L. Morison, 1934.

Lawrence, SIR THOMAS (1769-1830). British painter. He was born May 4, 1769, youngest of 16 children of the



Sir T. Lawrence,
British painter
After C. Landseer

landlord of the White Lion, Bristol. In 1772 his father removed to the Black Bear, Devizes, and later to Bath, where his precocious artist son was installed in a studio before he was twelve. In 1787 the boy went to London, received the encouragement and advice of Reynolds, entered the R.A. schools, and obtained court patronage. At the king's request he was made an "extra" associate of the Academy, 1791, the first and last to enjoy that irregular honour. Appointed principal portrait painter to George III in 1792, he was elected R.A. in 1794. Among his portraits may be cited those of Metternich, Wellington, Blücher, the Russian and Austrian emperors, the king of Prussia, and Pius VII. In 1820 he was elected P.R.A. He died suddenly in London, Jan. 7, 1830, and was buried in S. Paul's Cathedral.

Lawrence's portraits of children have a place of their own in British art, and his fashionable women, though open to the charge of superficiality, are always splendidly vivacious. A great array of his portraits of kings, queens, and statesmen is to be seen at Windsor Castle, in the National Gallery, the National Portrait Gallery, and other London collections. As an historical painter he was a failure. *See* illus. Abernethy, J.; Bentinck, Lord W.; Burdett, Sir F.; Canning, G.; Canova, A.; Caroline; Codrington, Sir E.; Curran, J. P.; Davy, Sir H.; Farren, Eliz.; George III; George IV; Grey, 2nd Earl; Hertford, 3rd Marquess of, etc. *Consult* Life and Correspondence, D. E. Williams, 1831.

Lawrence, THOMAS EDWARD (1888-1935). British administrator, archaeologist, and author. Born near Snowdon, Wales, of Anglo-Irish blood, Aug. 15 or 16, 1888, he was educated at Oxford high school and Jesus College. Assistant at

Oriental excavations led by Woolley, Petrie, and Hogarth, he was working on the Hittite ruins near Carchemish along the Euphrates when the First Great War broke out, and was soon an intelligence officer in Egypt.

When Sherif Hussein of Mecca revolted against the Turks in 1916, Col. Lawrence was sent as



T. E. Lawrence,
"Lawrence of
Arabia"

British representative to his headquarters. He organized the Arab Bureau, and practically led the Arab rising, directing its strategy as chief of staff to Hussein's son, the Ameer

Feisal. Lawrence rendered invaluable help to Allenby's forces in Palestine by securing their right flank, and his Arabs entered Damascus first, on Oct. 1, 1918, holding it for four days until relieved. He was awarded the D.S.O., and King Hussein made him a prince of Mecca. One of the British delegation at the peace conference of 1919, he served as adviser on Middle East affairs at the Colonial office, 1921-22. By his influence Feisal was made king of Iraq and his brother Abdulla was placed on the throne of Transjordan. But disappointment at the treatment of the Arabs was one cause of Lawrence's withdrawal from politics.

In search of privacy he enlisted in the R.A.F. under the name of Ross. Rumours sprang up, in 1923 he was discharged, and joined the ranks of the Royal Tank Corps. In 1925 he was permitted to transfer back to the R.A.F., and in 1926, apprehensive of publicity which might follow the publication of his book, *Revolt in the Desert*, he obtained a posting to Karachi. Next he changed his name by deed poll to Shaw. Returning to England in 1929, he was stationed near Southampton, and was on the ground staff of the British Schneider trophy team, later specialising in motor boats.

The "uncrowned King of Arabia" had published an account of his part in the Arab revolt as *The Seven Pillars of Wisdom*, but the 1926 edition was limited to ten copies only, *Revolt in the Desert* being an abridgement. His fine prose translation of the *Odyssey* was issued in the U.S.A. in 1931, England 1935. The *Mint*, telling of his life in the R.A.F., was pub-

lished in America in a limited edition of twelve copies, general release being deferred until 1950.

Lawrence, the brilliant leader and tactician, had privately always been diffident and unambitious, with a hatred of responsibility and a dread of publicity. These characteristics grew stronger after he retired from public life. He remained on intimate terms with literary figures, Hardy, E. M. Forster, David Garnett. Early in 1935 "Aircraftman Shaw" retired to his small cottage at Cloud's Hill, near Moreton, Dorset. But while motor-cycling near Bovington camp, he swerved to avoid two cyclists and crashed, dying May 19, 1935.

Lawrence's letters, ed. D. Garnett, appeared in 1938. The best accounts of his work are in T.E.L. in *Arabia and After*, B. H. Liddell Hart, 1934; and L. and the Arabs, R. Graves, 1927. A collection of his smaller works was edited by his brother as *Arabian Miscellany*, 1939. Consult T.E.L. to His Biographers, Graves and Hart, 1941.

Lawrence Trophy. Presented in 1934 by Sir Walter Lawrence (1857-1940), to be awarded every year to the batsman making the fastest century in first-class cricket. The first winner was Frank Woolley of Kent, who reached the hundred in 63 mins. The best time recorded was 51 mins. by J. Hardstaff, playing for Notts in 1937.

Law Reports. Recognized accounts of legal decisions recorded for future use. In the courts of the U.K., when a case is cited by way of precedent, it must be so cited either by the relation of counsel who was in the case, or who heard it decided, or else by way of quotation from a volume of some law report. From early days in English law there have been barristers who have made it their business to write down, print, and publish reports of notable cases decided in the various courts; and by the middle of the 18th cent. there was a whole army of these reporters, whose reports are accepted as authentic. Each reporter, or set of reporters, undertook one court, e.g. the Rolls Court, the Common Pleas, the house of lords. The reports were all private enterprises.

Later there was established by the legal profession a Council of Law Reporting, which has since published *The Law Reports*, written by barristers and edited by a barrister of standing. Notwithstanding this semi-official publication, other reports are still published by private enterprise,

notably *The Times Law Reports*, the *All England Reports*, and *The Law Journal Reports*. All are of equal value, being all written by barristers, and a report by any other person cannot be cited in the courts. In Scotland and Ireland similar Reports are published.

Law Revision Committee. Appointed by the lord chancellor in 1934 to consider how far legal rules require revision in present-day conditions. As a result of reports made by this committee, extensive changes have been made in many branches of the law. The rule which (subject to minor exceptions) prevented any action being brought where the person entitled to bring the action had died was abolished in 1934; the rule which made a husband liable for his wife's torts (e.g. slanders) in 1935. The law has been changed so as to operate justly between two persons one of whom has paid money to the other under a contract the performance of which has become impossible (1943). Rules of contributory negligence have been amended (1945). The committee recommended that sections of the Statute of Frauds and Sale of Goods Act requiring written evidence of certain contracts be repealed and the doctrine of consideration be abolished. The committee includes judges, practising lawyers, and professors of law.

Law Sittings. In English law, the periods of the year during which the Court of Appeal and High Court are sitting. The year is divided into four sittings—Michaelmas (Oct. 12-Dec. 21); Hilary (Jan. 11-the Wed. before Easter); Easter (Tuesday after Easter week to Friday before Whit Sunday); Trinity (Tuesday after Whitsun week to July 31). These periods may be varied by order in council and in particular the "long vacation" (between the Trinity and Michaelmas sittings) may be shortened by the Trinity sittings ending later, or the Michaelmas sittings beginning earlier. Until the Judicature Act, 1873, the year was divided into terms, not sittings. See *Law Terms*.

Law Society. An association founded in 1825 and incorporated by royal charter in 1845 as the Society of Attorneys, Solicitors, Proctors, and others, not being barristers, practising in the courts of law and equity of the United Kingdom. This was amended by supplemental charters. Its two main functions are as a voluntary association of solicitors for their mutual protection and benefit, and

as a body exercising under the various solicitors' acts statutory powers affecting the profession as a whole. It instituted lectures for students in 1833, and in 1836 obtained judicial authority to examine students on the completion of their articles.

The society now acts as registrar of solicitors, supervises the keeping by solicitors of accounts of clients' money, controls and conducts the examinations of articled clerks, grants and renews certificates, and proceeds against unqualified persons and persons charged with professional misconduct. With the provincial law societies it issues certificates entitling litigants to take or defend proceedings as poor persons. Every practising solicitor, past or present, in England and Ireland, and every writer and writer to the signet in Scotland, is eligible for membership. In 1941 provision was made for membership being compulsory for every practising solicitor; this not, however, taking effect until approved by a two-thirds majority of all practising solicitors. The society has a president and vice-president, and council. Not more than 40 members nor fewer than 20 are elected by the members; and ten extraordinary members may be nominated by the provincial law societies. The headquarters of the Law Society are at Bell Yard, London, W.C. See Poor Persons Procedure.

Lawson, CECIL GORDON (1851-82). British painter. Born at Wellington, Salop, Dec. 3, 1851, he received some instruction from his father, but was mainly self-taught. In 1870 he began to exhibit landscapes at the R.A., and started drawing on wood for engravers. In 1879 he went to live at Haslemere, where his August Moon, now at the Tate Gallery, was painted in 1880. He died at Brompton, June 10, 1882.

Law Stationer. Retailer whose principal customers are connected with the legal profession, and who sells pens, penknives, paper, sealing-wax, tape, almanacks, and other things that lawyers use in their work. In former days law stationers added materially to their income by undertaking to engross deeds, for which purpose they employed expert copyists.

Law Terms. The periods into which the year was divided for the purposes of legal business in England and Wales, until the Judicature Act, 1873, when terms were replaced by sittings, except for the purposes of the Inns of

Court, where a student must still keep the required number of terms before he can be called to the bar. (See Law Sittings.)

Sittings of the courts "after term" used formerly to take place at times outside the legal terms at some place other than the law courts at Westminster Hall. In Dickens's *Pickwick Papers*, Bardell v. Pickwick was thus heard at the Guildhall "after term."

Lawther, SIR WILLIAM (b. 1889). English trade union leader. Born May 20, 1889, at Choppington, Northumberland, he started work at 12½ in the local mines and later worked in the Durham coalfield, where he became prominent in trade union matters. His rise in the Mineworkers' Federation of Great Britain (later the National Union of Mineworkers) was rapid, and he became vice-chairman, 1934, and president, 1939. In 1948-49 he was chairman of the gen. council of the T.U.C., being knighted 1949. Lawther was Labour M.P. for Barnard Castle, 1929-31.

Lawyer. Popular name for any member of the legal profession. A good lawyer, in the profession, means one who has great learning in the law, though he may be a poor advocate. Conversely, a man may be a great advocate but "no lawyer." See Advocate; Barrister; Solicitor.

Laxative (Lat. *laxare*, to loosen). Medical term for a substance which slightly stimulates the action of the bowels. Many foods have a laxative action, such as wholemeal bread, honey, fruit. Simple medicinal laxatives are sulphur, magnesia, and senna.

Layamon (c. A.D. 1200). English poet. A priest of Areley in Worcestershire, he was author of *Brut*. This is a free translation into verse of Wace's chronicle *Brut d'Angleterre*, which in turn was a paraphrase of Geoffrey of Monmouth's Latin chronicle. *Brut*, the first English poem after the Norman Conquest, illustrates the transition of language and metre from Anglo-Saxon to Middle English. The vocabulary is English, but the grammar shows Norman influence. The poem makes Brut or Brutus, grandson of Aeneas the Trojan, the progenitor of the British race, and traces the history of Britain down to Cadwallader, a Welsh prince of the 7th century.

Layard, SIR AUSTEN HENRY (1817-94). British diplomatist and archaeologist. He was born in Paris March 5, 1817, of Huguenot des-

cent, and studied law in London, 1833. He travelled in Persia, 1839; explored Assyrian ruins at Nimrud and Kuyunjik, 1845-47; and published *Nineveh and its Remains*, 1848-49, the achievement for which he is chiefly noted. Appointed attaché at Constantinople, he next explored B a b y l o n, which he described in *Nineveh and Babylon*, 1853. His sculptural finds are in the British Museum.

Having held offices as a Liberal M.P., Layard went as minister to Madrid, 1869, and ambassador to Constantinople, 1877. Retiring in 1880, he became the first president of the Huguenot Society of London, 1885. He died in London on July 5, 1894. His valuable collection of paintings passed, on his widow's decease, 1912, to the National Gallery. Fifteen old masters, claimed by the family as portraits outside the terms of the bequest, formed the subject of an appeal to the house of lords, and under a monetary arrangement were retained by the nation. *Consul's Autobiography and Letters*, ed. W. N. Bruce, 1903.

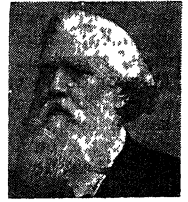
Lay Days. The days which, under a charter-party or bill of lading, are allowed for loading or discharging a ship's cargo. If the ship is detained for a longer period demurrage may be payable.

Laye, EVELYN (b. 1900). British actress and singer, born in London, July 10, 1900. She first appeared



Evelyn Laye,
British actress

on the stage at Brighton in 1915, and became a star of musical comedy with a revival of *The Merry Widow*, 1923. Her greatest success was in Noel Coward's operetta *Bitter Sweet*; she played and sang the leading part of Sari Linden in New York, 1929, then in London, 1930, and subsequently in revivals. She played the title-role in *Helen!* (1932), Violet Grey in a revival of *The Belle of New York* (1942), and Katherine in *Three Waltzes* (1945). She first appeared on the variety stage in 1938, figured in several films and played principal boy in panto-



mimes in London and Birmingham. In 1934 she married the actor Frank Lawton.

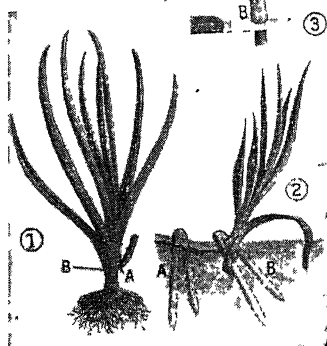
Layering. Method of increasing trees, shrubs, and such plants as magnolia, rhododendron, vigorous roses, carnation, and strawberry. To provide a good-sized plant in a short time, layering is carried out in summer and autumn by choosing a branch or shoot that can be bent down to ground level, making a slit in it, and pegging it firmly in a small heap of sandy soil. A slit about halfway through the stem of tree or shrub will suffice; when layering carnations, the cut is continued upwards through a joint. The slit portion should be kept open when pegging down the layer. The peg is inserted over the stem of the shoot or branch just behind the slit. Strawberries need different treatment; the first small plant on the runner is layered, others being cut off, and is fixed by a peg in a small pot of sandy soil, the pots being plunged to the rims in the ground. The layers of carnation become rooted in about six weeks; those of shrubs should be left undisturbed at least a year. During dry weather the layers must be kept moist.

Layman (Gr. *laos*, people). An unprofessional person, especially one who does not belong to the clergy. The word is used also for those who are not lawyers. In the Church of England the house of laity, one of the three houses of the Church Assembly under an Act of 1919, commonly called the Enabling Act, is a body of laymen elected by procedure laid down in the Representation of the Laity Measure, 1929. See Church Assembly; Ecclesiastical Law; Enabling Act; House of Laity.

Lay of the Last Minstrel, THE. Poem in six cantos, by Sir Walter Scott, descriptive of manners, customs, and scenery of the Borders about the middle of the 16th century. The story, the action of which takes place within three nights and three days, is told at Newark by an aged minstrel, and relates the love of Lord Cranstoun for the Lady Margaret of Branksome Hall, "the flower of Teviot." Its theme was suggested by the countess of Dalkeith, its metrical form by Coleridge's *Christabel*. It was published in Jan., 1805.

Lay Reader. In the Church of England, one who, holding a bishop's licence, assists in the work of a diocese. Lay readers include diocesan readers, parochial readers, and evangelists. Lay readership

does not afford its possessor title or right to proceed to Holy Orders, and ordinarily it should not be a means of livelihood. The lay reader movement dates from 1866. The Central Readers' Board,



Layering applied to carnations. 1. Rooted layer ready for planting. Piece of stem at A is cut off. B indicates depth at which to plant. 2. Pegging down layer. A illustrates peg wrongly inserted; B, a correctly placed peg. 3. How stem is split at A or B. Right, side view after cutting

founded 1922, coordinates and develops the work of lay reading, it arranges annually courses of instruction at Selwyn College, Cambridge. The Lay Reader Student Association promotes training for work in the colonies and missions. A monthly magazine is issued. Headquarters of the movement is at 103, Abbey House, Westminster.

Lays of Ancient Rome. Poems by Lord Macaulay. These four narrative poems were published in one vol. in 1842, and were at once extraordinarily popular. Their anecdotal style, stirring rhythm, and heroic language appealed to a public brought up on romantic fiction and verse. Many successive generations of schoolboys recited Macaulay's retelling of the legend of Horatius. See Cooles, Horatius.

Layton, WALTER THOMAS LAYTON, BARON (b. 1884). British economist and newspaper proprietor. He was born in London, March 15, 1884, and was educated at King's College school, Westminster City school, University College, London, and Trinity, Cambridge, where he became a lecturer in economics, 1912. He went as representative of the ministry of

Munitions on missions to Russia and the U.S.A. in 1917, and was British delegate to the world economic conference of 1927. Editor of *The Economist*, 1922-38, he became chairman of the *News Chronicle* and *Star* in 1930, in which year he was knighted, and made a director of Reuters. He had been made C.H. in 1919. Layton was director-general of programmes at the ministry of Supply and a member of the Supply Council, 1940-42, becoming then chief adviser on planning to the ministry of Production in 1942. He was raised to the peerage in 1947. He wrote *Introduction to the Study of Prices; Relations of Capital and Labour*. He was three times an unsuccessful Liberal candidate for parliament.

Lazaretto. Name given to a hospital or place of detention for persons suffering from a contagious disease. It was also known as a pest house. The term is derived from Lazarus the beggar, whose sores were supposed to be due to leprosy. See Hospital; Leprosy.

Lazarist Fathers or VINCENTIANS. Name given to the Congregation of the Priests of the Mission. This R.C. order was founded by S. Vincent de Paul and endowed by the comtesse de Joigny, 1624, and its familiar appellation is derived from the Collège de S. Lazare which the order opened in Paris, 1632. The order was confirmed by Pope Urban VIII, 1632, and is devoted to mission work among rural populations and to education for the priesthood. S. Lazare took its name from a house for lepers founded by a religious and military order called Lazarists in the time of the Crusades. Under the patronage of the society an organization known as the Virgins of Love was started by Louisa de Gras to minister to the sick poor.

Lazarus (Heb., Elcazar). Name of two characters in the N.T. The Lazarus of John 11 was a native of Bethany, a village on the S.E. side of the Mount of Olives, 2 m. S.E. of Jerusalem, now called El Aziriyeh, the place of Lazarus. A man of some wealth and position, he lived with his two sisters, Mary and Martha; and Jesus, who was often a guest of the family, raised Lazarus from the dead. An ancient Jewish tomb, hewn out of the rock, to which there is a descent by 27 steps, is still shown as the place of Lazarus's grave.

The other Lazarus, in the parable of the callous rich man (Lat. *Dives*), is the beggar who lay at his gate full of sores (Luke 16). See Dives.



Lord Layton, British economist

Lazulite. A mineral sometimes found in quartz or pegmatite veins, or in derived sands. Lazulite is a complex basic phosphate of aluminium, iron, magnesium, and calcium, and occurs as blue monoclinic crystals or grains.

Lazurite, OR **LAPIS LAZULI**. One of the feldspathoid group of minerals, having a composition of sodium aluminium silicate with sodium sulphide. Lazurite crystallises in the cubic system; the crystal form is rare; it is most usually found as azure blue irregular masses. Its occurrence in crystalline limestone near intrusive granites suggests a contact-metamorphic origin. Too soft for use in jewelry, polished lazurite is an ornamental stone, and ancient Egyptian amulets carved in it are common. Powdered lazurite, now usually replaced by a cheaper synthetic product, was used in the manufacture of ultramarine pigment.

Lea OR **LEE**. River of England. Rising near Houghton Regis, in the S. part of Bedfordshire, it flows E. across Herts, then S. as the boundary between Middlesex and Essex, to the Thames near Blackwall. Its length is 46 m., of which 28 are navigable. The Lea's chief tributary is the Stort, and it passes by Luton and Hatfield. There is good fishing in the upper portion, and the river is associated with Izaak Walton. The new navigation from Enfield Lock to Hackney is an artificial channel made for the lower course of the river; along it are the reservoirs of the Metropolitan Water Board. Some water of the New River is taken from the Lea, which is managed by a board of conservators, elected by local authorities.

Lea OR **LEY**. Anglo-Saxon word meaning a meadow. A variant of it is loo, as in Waterloo, etc. It is used specially for temporary grass grown on arable land. *See* Grass; Ley Farming; Meadow.

Leaching. Term for the movement by water of soluble substances through the earth. It is so used in geology (*q.v.*), and also for the carrying from the soil into the drainage by rain of some substances valuable to plants: the ions of nitrate, sulphate, chloride, and calcium seem to be more readily lost in this way than those of phosphate or potassium.

Leaching is also the name of a chemical process used in hydrometallurgy. Usually only the low-grade ores are treated in this way and the only metals extracted commercially are copper, silver,

and gold. The process is natural at Rio Tinto, where copper is leached out from the ore body by natural waters. Usually it is assisted by man, the ore being first crushed and sometimes roasted and then piled into heaps or large vats. Weak acid or alkali solutions, poured through the ore, extract the metal, which is later precipitated from the solution. Gold is extracted by a weak solution of potassium cyanide. *See* Cyanide Process.

Leacock, **STEPHEN BUTLER** (1869–1944). Canadian economist and humorist. He was born at Swanmoor, Hants, Dec. 30, 1869, but was taken to Canada at the age of six. Educated at Toronto university, he became a master of modern languages, 1891–99, then, at McGill university, was successively lecturer in political science, 1903, associate professor of political science and history, and from 1908 to 1936 in charge of the department of economics. He died March 28, 1944.

Besides critical studies of Mark Twain, 1932, and Dickens, 1933, Leacock wrote much on political economy, *e.g.* *The Unsolved Riddle of Social Justice*, 1920; *Economic Prosperity of the British Empire*, 1930. But he attained wider popularity with his short stories, parodies, and pure nonsense, *e.g.* *Literary Lapses*, 1910; *Nonsense Novels*, 1911; *Behind the Beyond*, 1913; *Moonbeams from the Larger Lunacy*, 1915; *Winsome Winnie*, 1920; *Winnowed Wisdom*, 1926; *Short Circuits*, 1928. These were the works of which he claimed to be most proud. In *Humour and Humanity*, 1937, he revealed a kindly philosophy. His autobiography, *The Boy I Left Behind Me*, was published in 1947.



Stephen Leacock,
Canadian author

LEAD: ITS SOURCES AND USES

F. D. L. NOAKES, Lecturer on Metallurgy, Imp. Coll. of Science and Techn.

This article is one of a group on the metals of the world, e.g. Gold; Silver; Tin. See also Furnace; Metallurgy; Mining; Smelting; Template. It is followed by an article on Lead Poisoning

Lead, a metallic element, is one of the most important of the world's industrial metals, and has been known from a very early period, being mentioned in the O.T., in Numbers and Job. It constituted part of the spoils which the Israelites took from the Midianites. The Romans worked lead mines in England, and fine examples of lead work of early Saxon times have been found.

Pure lead is bluish-grey in colour, the surface usually being covered by an oxidised layer, which forms rapidly on a clean surface, hiding metallic lustre. The element, Pb (Lat., *plumbum*), is the heaviest in the fourth group of the periodic table, tin being its neighbour. It thus has four valency electrons; normal valencies are 2 and 4, though other forms of combination exist. With atomic number 82 it has atomic weight 207.21; melting point 327° C.; boiling point 1,740° C.; crystal form, face-centred cubic, with lattice constant $a=4.9395$, and an interatomic distance of 3.4927 Angstrom units; specific gravity 11.4, making it the heaviest of the common metals. Its electrical conductivity is only 7.2 and heat conductivity only 8, compared with silver's 100.

Extremely soft and malleable, flowing readily under normal pressure, lead can be extruded into pipes or rods or rolled into thin sheet, but not drawn into wire, because it has a low tenacity. Leaded roofs of churches are known to creep noticeably under their own weight. It has a high resistance to corrosion, which accounts for its use for water pipes since before Roman times. The metal is soluble in dilute nitric acid, but not in dilute hydrochloric or sulphuric acids, although hot, concentrated acids dissolve it readily. It starts to volatilise below boiling point, but cannot be distilled.

Lead is found in the crust of the earth in various forms; rarely native in thin laminae or globules; localities where it so occurs are Cumberland and parts of Ireland, Spain, and Madeira. It occurs as minium or oxide of lead; anglesite or sulphate; cerussite or white lead ore, the carbonate, much worked in the U.S.A.; as pyromorphite or phosphate; as crocoisite or chromate in Siberia and South America; as chloroarsenite; and occasionally in association with selenium, tellurium, tungsten, vanadium, and chromium.

Its chief source is the mineral galena (*q.v.*), its sulphide, widely

distributed throughout the world, there being few countries where this is not found and worked. The mineral, rarely found pure, is associated in ores with, *e.g.*, silver, antimony, arsenic, copper, and zinc, and frequently gold. It occurs in Derbyshire and N. England in the mountain limestone; in Saxony in gneiss; in Bohemia in clay slate; in Spain in granite formations; in France, Russia, Sweden; in all British dominions, particularly Australia; and extensively in the U.S.A.

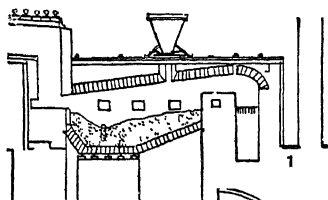
Extraction of the metal from its principal ore is not difficult, the melting point being low. There are three distinct processes in use, all calling for a preliminary roasting. In the first, known in the U.S.A. particularly as the roasting and reaction process, the ore is roasted in a reverberatory furnace, thus converting the bulk of the sulphide into sulphate and oxide, after which the temperature is raised, and possibly new sulphide added. Reaction takes place between the oxidised products and the unchanged or added sulphide, yielding molten lead and a slag rich in the metal. In the old Flintshire process, lime is added towards the end of the reaction, followed by a little coal to complete the operation.

The second process, by which much the greater portion of the world's lead is now obtained, the roasting and reduction process, consists in roasting in reverberatory or mechanical furnaces and then sintering by means of an air blast, after which the agglomerated ore or half formed matte is melted in blast furnaces with charcoal or coke; oxidised lead ore, gold or silver ore may be added. The lead runs down into a forehearth, whence it is ladled out; while the slag is continuously removed through slag holes. The metal is cast into long pigs, in which form it is known as "base bullion." An imperfectly

melted product, a matte, is also formed in the furnace and removed for further treatment.

In the third process, the iron reduction method, the ore is roasted in shaft or reverberatory furnaces, and iron added to form a matte, which is roasted again and smelted.

The lead resulting from these processes is always impure, carrying antimony, arsenic, bismuth, copper, iron, tin, zinc, usually silver, and sometimes gold. Much of the silver which is produced today is recovered as a by-product in the extraction of lead. Some ores are so rich in silver that it is not easy to decide which is the primary



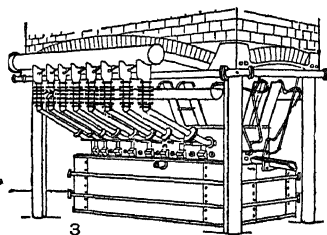
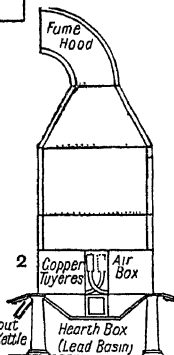
and which the by-product. At the Broken Hill works, N.S.W., probably the largest individual lead-smelting establishment in the world, the silver recovered may exceed 5,000,000 oz. a year. Silver is taken from crude lead by the Parkes process, depending on the easy separation of

molten lead and zinc, and the tendency of the silver to collect with the lighter zinc-lead mixture at the top of the container, where it can be skimmed off. The quantity of zinc added to the molten lead for this operation is about 2 p.c. of the weight of the latter.

In carrying out the process the crude lead is melted, in quantities which may exceed 50 tons at a time, in iron vessels or in a reverberatory furnace, the temperature being raised to the melting point of zinc. Steam is then

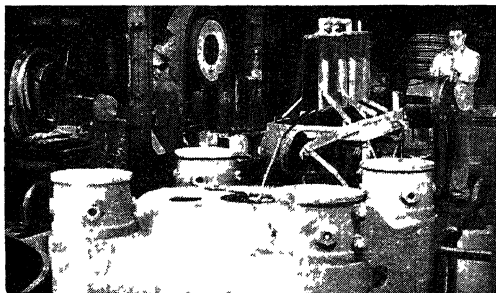
blown through the molten mass. On cooling, the zinc solidifies first and floats to the surface, carrying with it nearly all the precious metals, forming a crust, which is removed and treated separately for the recovery of the zinc, silver, or gold. The desilverised lead will then be further refined for the removal of worthless impurities. An electrolytic method of refining the crude lead and of recovering the silver is also in use.

Lead, resisting corrosion, and by its low melting point enabling easy joining, is manufactured in the form of sheets and pipes for use in building work; as foil, collapsible tubes, and shot; and is used for chemical plant. Lead alloys are used for cable sheathing, lead acid batteries, type metal, anti-friction metal, and certain brasses. The most important compounds of lead are litharge and minium, red and white leads. These compounds are used in the manufacture of pigments and paints, glass, pottery, and joints in mechanical engineering. Other compounds are used in tetra-ethyl petrols.



Lead. 1. Reverberatory furnace; the ore is introduced through the conical-shaped hopper on the top. 2. Moffett double-hearth furnace; copper blast pipes deliver a blast of air on top of the hearth box, thus assisting the reduction of the ore. The lead overflows and is delivered through a spout into a lead kettle. 3. Rectangular blast furnace

The world's total production of metallic lead reached 1,800,000 tons in 1938, the principal contributors being the U.S.A. (about 370,000 tons), Mexico (300,000), Australia (300,000), and Canada (200,000). The U.K. that year yielded 33,000 tons from native ore. The U.K. uses some 300,000 tons annually: for sheet and pipe 29 p.c., cables 25 p.c., batteries 16 p.c., compounds 16 p.c., solder and alloys 7.5 p.c., shot 1.5 p.c., foil and tubes 1.5 p.c., other uses 3.5 p.c. Prof. W. R. Jones has stated that the world's stocks of lead ores are getting low and that, if consumption is continued at the present rate, the sources will be exhausted in 20 years. *Consult Metallurgy of Lead, H. O. Hofman, 4th ed., 1895; H. F. Collins, 1910; Lead, J. A. Smythe, 1923.*



Lead. Stage in manufacture showing extension of lead pipe with water cooling process
Courtesy of Lead Industries Development Council

Lead. In printing, a piece of metal placed between lines of type. Type thus opened up is called leaded matter; where the lines are set close, they form solid matter. Today, when most type matter is set and cast mechanically, the appearance of leaded matter is given by casting the type on a deeper body than normally belongs to that size of type. Thin slips of lead or brass are still used for spacing displayed type matter.

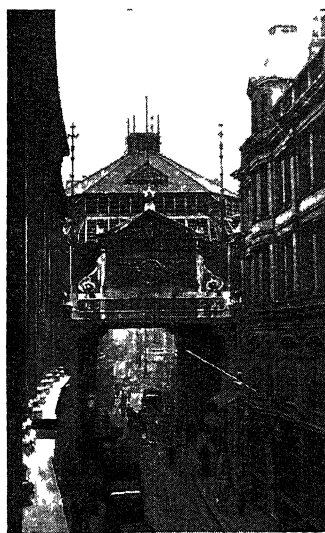
Lead. A leaden plummet attached to the end of a line and used for taking soundings, *i.e.* ascertaining the depth of water beneath a ship's keel. The depth of water is indicated by strips of white or coloured cloth, called marks, woven or knotted into the line at certain intervals, *e.g.* 1, 2, 3, 5, 10 fathoms. The intervening lengths of unmarked line are called deeps. A lead line is generally 20 fathoms long. The plummet weighs 7 to 11 lb. and has a hollow base fitted with tallow so that it will bring to the surface sand or mud as a further aid to assisting the navigator in fixing his position; this is done in conjunction with a chart showing the composition of the sea bed at certain depths and positions. For deeper sounding a plummet is available weighing 25 to 30 lb. on a line a mile or more in length marked at intervals of 10 fathoms. On most large ocean-going ships lead and line have been replaced by an echo-sounding device.

Lead Azide (PbN_6). Sensitive, highly explosive compound employed for the initiation of high explosives. It is the most important alternative to fulminate of mercury. Large crystals of lead azide are very sensitive, but the normal material is safe to handle, and much less sensitive than fulminate of mercury. Lead azide is five to ten times more efficient than the latter in initiating high explosives, and is used in detonators (*q.v.*). It is made by treating a solution of lead acetate with a solution of sodium azide.

Lead Block Test or **TRAUZZ TEST.** Method used for comparing the power of explosives. It depends upon measuring the expansion produced by a standard weight of explosive fired in the cavity of a lead block of fixed dimensions. The explosive and standard detonator are placed centrally at the bottom of the cavity; this cavity is then filled with sand and the charge fired. The vol. of the enlarged cavity, after cleaning, is determined by

filling with water. The relative power of the explosive is referred to blasting gelatine = 100. On this scale, tetryl = 67, picric acid (lydite) = 56, T.N.T. = 50.

Leadenhall Market. London's chief poultry market. It is on the S. side of Leadenhall Street, be-



Leadenhall Market, London. Entrance from Whittington Avenue

tween Gracechurch Street, where is the main entrance, and Lime Street, E.C. The old manor of Leaden Hall, once the property of the Neville family, was bought by Sir Richard Whittington, and the estate was acquired by the corporation in 1411. The hall was from an early date used by the civic authorities, and the market dates from the 13th century. It was destroyed by the Great Fire. The existing buildings were erected in 1881, from designs by Sir H. Jones, at a cost of £99,000 and the expenditure of £148,000 on new approaches. The remains of a supposed Roman basilica were discovered here in 1880.

Leadenhall Street. A London thoroughfare, connecting Cornhill with Aldgate. First mentioned in 1622, it was largely rebuilt in the 19th century. Here are Leadenhall Market; New Zealand Chambers, designed by Norman Shaw in 1873; the offices of the P. & O., Cunard, Furness, and other shipping lines; S. Katherine Cree church (Christ Church), with 16th century tower; and, at the corner of St. Mary Axe, the church of S. Andrew Undershaft, with memorial of John Stow. Until 1862, near the Lime Street corner, stood the old East India House, where Charles Lamb was a clerk.

On this site now stand the magnificent premises of the new Lloyd's, 1925-28. The museum of the E. India House was removed to S. Kensington. The Ship Tavern, afterwards The Ship and Turtle, dating from 1377, became a favourite centre for civic and masonic gatherings.

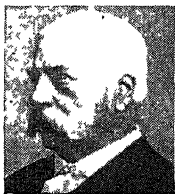
Leader. Name given to the leading article in English newspapers. In the U.S.A. leading articles are called editorials. Especially when discussing public questions they express the views with which the journal publishing them wishes to be identified, and are distinguished by the use of the word "we," often referred to as "the editorial we." The name is alternatively explained as being due to the fact that these articles were given the leading place in the newspaper, or to the custom of setting them in "leaded" type, *i.e.* with spaces between the lines.

Newspapers at one time consisted of news and advertisements. The first approximation to a leader or editorial was a political paragraph in the Morning Chronicle of May 12, 1791. The leader was developed by the Morning Post and the Courier, and especially by The Times, which during Delane's editorship used it as a medium for exclusive news as well as views. Before the revolution in English journalism introduced by the Daily Mail in 1896, leaders in London morning papers were usually three in number, the first being devoted to what the paper thought the most pressing question of the day; and each leader was in three equal paragraphs. They had no titles, and the first and actually leading article would sometimes be written at the outset by more than one hand, and be given its final form by the editor.

Among English provincial papers the Manchester Guardian was among the first to make leading articles a prominent feature and to print headings to them. The tendency nowadays in popular British papers is to print only one leader, crisp and controversial; but The Times retains its three or four daily, the last being often a whimsical or humorous essay. K.C.s are also called leaders to distinguish them from junior barristers.

Leader, BENJAMIN WILLIAMS (1831-1923). A British landscape painter. Born at Worcester, March 12, 1831, he studied at the Worcester art school and the R.A. schools, London. He first exhibited at the R.A. in 1854. His

landscapes are very precise in drawing and detail, but lack any force of design, and have sometimes been cited as typical of all that was worse in the conventions of Victorian popular art. Nevertheless his works have often commanded high prices among connoisseurs. They include Tintern Abbey in Moonlight, The Weald of Surrey, and In the Evening It Shall Be Light. He became A.R.A. in 1883 and R.A. in 1898. His name was originally B. Leader Williams.



B. W. Leader,
British painter

Leadhills. A village of Lanarkshire, Scotland. It is 18 m. S. of Lanark, with a station on a branch railway line which joins the main line 6 m. away. It is said to be the highest village in Scotland, 1,300 ft. above sea level, and is noted for its lead mines, which have been worked since about 1511. Allan Ramsay and William Symington were born here. Pop. 850.

Leading Case. A decision of a court which establishes a legal principle of great importance, the decision being frequently quoted and relied on in later cases.

Leading Question. A question which suggests the answer that is required by the person asking it. In court proceedings such questions must not be put in examination to a witness except as to matters about which there is no dispute. Leading questions may always be asked in cross-examination, since the witness is normally opposed to the person asking the question.

Lead Ores. The most important ore-mineral of lead is lead sulphide, galena (*q.v.*). This almost invariably contains some silver; in fact, most of the world's silver is recovered as a by-product from lead ores. Cerussite (lead carbonate) and anglesite (lead sulphate) are often formed by the oxidation of primary galena near the surface, especially in hot, dry climates. Cerussite was important in the upper levels of the well-known lead deposits at Coeur d'Alene, Idaho, and Broken Hill, N.S.W.

Although they may occur in separate ore bodies, lead and zinc minerals are frequently intimately associated. Most lead deposits are found in sedimentary rocks, often calcareous, as lodes, veins, replacements, and disseminations.

Galena was deposited from hot mineralising solutions emanating from an igneous source in depth. These solutions may migrate a long way from the parent igneous rock before precipitating their lead content. The parent igneous rock may not be exposed, as in the old lead fields of Derbyshire and Durham. But other deposits may have been formed near the igneous source under higher temperatures and pressures, as at Broken Hill, N.S.W.; Sullivan Mine, B.C. (the largest lead-zinc mine in the world); and Bawdwin mines in Burma.

Concentrations of lead ore may be found in limestones immediately beneath a blanket of impervious rock, such as shale (*e.g.* in Derbyshire), or dense porphyry (*e.g.* the Leadville district of Colorado). Where flat-lying beds of limestone have been favourable for replacement by galena, the ore may follow the bedding and give rise to "flats." Lead has been won from veins in Cornwall and Devon.

Lead Poisoning. Acute poisoning is usually the result of taking a large dose of one of the lead compounds. The symptoms are pain in the stomach, vomiting, constipation as a rule but sometimes diarrhoea, great thirst, diminution or suppression of urine, and colic. Collapse and coma may precede death. The treatment of acute poisoning is to give an emetic or wash out the stomach, and then administer sodium or magnesium sulphate, which converts the lead into the insoluble lead sulphate.

Chronic poisoning may occur among those whose occupation compels them to handle lead or its compounds, or who are exposed without adequate protection to fumes from smelting. Chronic poisoning has also in isolated cases resulted from drinking water or beer contaminated with lead. When the condition arises in a workshop, it must be notified to the Home office. The main symptoms of chronic lead poisoning are constipation, colic, anaemia, producing a characteristic earthy colour of the skin, a blue line on the gums, and paralysis, "lead palsy," which most frequently attacks the nerves of the arm, producing the condition known as "wrist drop."

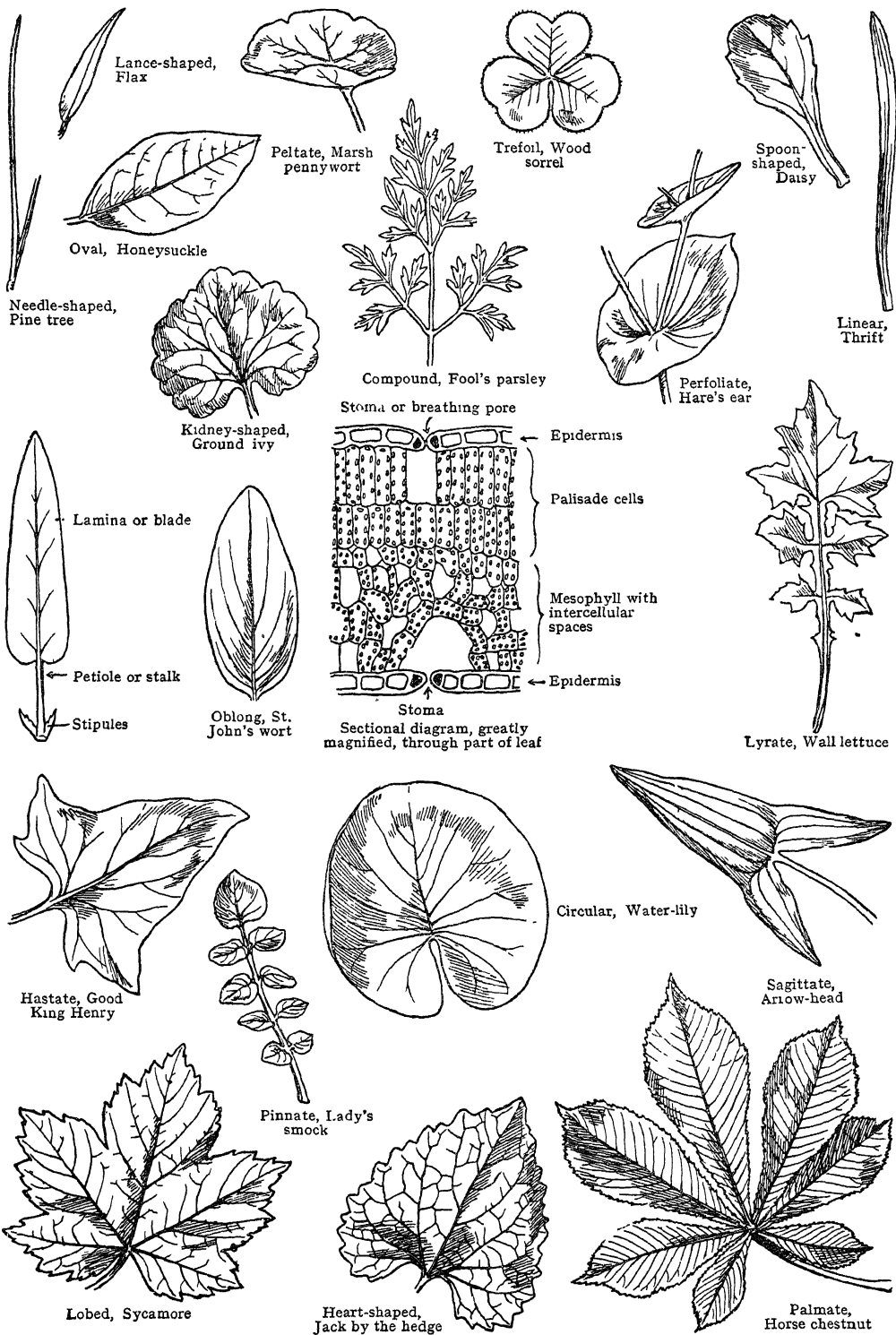
Lead Styphnate. A lead salt of trinitro-resorcinol, or styphnic acid, used extensively mixed with lead azide and aluminium in detonators. It is an orange yellow solid less sensitive to impact than either mercury fulminate or lead azide. It detonates violently on heating to about 250° C.

Leadville. A city of Colorado, U.S.A., the co. seat of Lake co. Situated on the W. declivity of the Mosquito Range, about 10,200 ft. high, it is 78 m. (direct) S.W. of Denver, and is served by rlys. The city owes its existence to the discovery of lead and silver ores in 1871, and soon had 35,000 inhabitants. The recovery of silver has greatly declined since 1893, but gold, located the previous year, has taken its place, and zinc and copper are also largely worked. Four-fifths of the world's supply of molybdenum is mined near Leadville, at Climax. -Pop. 4,774.

Leadville Furnace. Special form of the Raschette (*q.v.*) furnace, used at Leadville, Colo., for lead smelting. In shape it suggests a square section cupola, which in effect it is. Structurally it is divided into two independent parts, the upper of brick, banded or cased, and the lower forming a crucible, the special feature of which is provided by water jackets. This crucible portion admits of being readily detached from the upper section and removed for repairs. The ore is introduced through an opening in the side of the shaft, as in an ordinary cupola, the waste gases being carried off through another side opening near the top of a short chimney.

Leaf. A cellular plate of tissue borne in great numbers on a plant, and consisting of a deep layer of irregular cells with intervening air spaces (mesophyll) packed between two or more compact layers, *i.e.* epidermis and palisade. The epidermis is covered externally by a waxy or corky cuticle impervious to the passage of water. Both cuticle and epidermis are pierced by innumerable minute openings (stomata) to the air spaces, permitting transpiration and the admission of carbon dioxide from the atmosphere. The stomata can be closed when necessary by means of lips or guard-cells. The leaf is the laboratory of the plant, the mineral salts and water absorbed by the roots being brought to it through the vascular bundles and (under the influence of sunlight), with carbon dioxide synthesised into complex products.

Surplus water and the excess of oxygen due to assimilation is excreted through the stomata, and the assimilated material is removed through the phloem (*q.v.*) of the vascular bundles to nourish all parts of the plant. The structure of the leaf is such that the maximum number of cells is exposed to air and light. The position of



LEAF: SHAPE AND CONSTRUCTION OF TYPICAL LEAF FORMS FOUND IN BRITAIN

the leaf on the plant has relation to this purpose, and in temperate climates it is more or less horizontal—i.e. at right angles to the brightest diffused light. In the tropics many leaves hang so that the light strikes them obliquely to prevent excessive decomposition of chlorophyll.

The expanded portion of the leaf is the blade or lamina, the stalk is the petiole, and near the attachment of the latter to the stem there are often two blade-like expansions known as stipules.

There is great variety in the shapes of leaves, from the needle-like leaves of most conifers, and elliptical and spoon-shaped forms of other families, to the broad disks of water-lily. These are all simple leaves, but there are various forms of compound leaves, in which the lamina is broken up into leaflets, from the common trefoil form of clovers, wood sorrel, etc., to the twice pinnate leaves of mimosas, and the intricate umbelliferous plants. This breaking up of the lamina has relation to the necessity that the upper leaves should not deprive the lower ones of light, and the leaves will be found so arranged upon a plant that all may have their share of light. *See Botany; Cell; Photosynthesis.*

Leaf Insects (*Phyllinae*). Insects belonging to the family *Phasmidae*, order *Orthoptera*, and found in parts of the tropics of the Old World. The females are extra-

ordinarily leaf-like in colour and form and are hard to detect among vegetation. Their bodies are broad and flattened; the tegmina, or wing-covers, are even more leaf-like in form and have a vein-like surface pattern; the legs often have foliaceous expansions. Enclosed in separate capsules, the eggs often resemble seeds. The males have small tegmina and rather narrow bodies; unlike the females, they have wings well developed.

Leaf-mould. Residue of decayed leaves. This is of great benefit to many plants. Beech and oak make the best leaf-mould, but other small leaves are suitable. Leaves should be heaped up in autumn, the heap being turned every three months. In a year they may be dug into the ground or used as a top-dressing; for potting composts they should be left longer. Dry leaves help to form hotbeds. *See Compost.*

League (ultimately from the Gaulish *leuga*). Measure of length. Probably originating in ancient Gaul, it was adopted by the Romans and taken as the equivalent of 1,500 *passus* of 5 ft., or rather over 1½ English miles. Introduced into England in Norman times, its length was increased to about three modern English miles. It is now used as a nautical measure, and is equivalent to the twentieth of a degree, i.e. three geographical miles or 3·456 statute miles. The French kilometre league equals four kilometres.

THE LEAGUE OF NATIONS

Maxwell Garnett, Secretary, League of Nations Union, 1920-38

An account of the successes, failures, and scope of work of the international body set up at the end of the First Great War—"the war to end war"—from its foundation in 1920 until its absorption in the United Nations in 1946. See International Court of Justice; International Labour Organization; United Nations, etc.

The League of Nations came into being on Jan. 10, 1920, and lasted until April 18, 1946, when the United Nations took its place.

The history of Europe begins with the little city states of ancient Greece. These small towns divided between them a country no bigger than Scotland, and each was a sovereign independent state. They shared the same civilization, but they never attained political unity. They were absorbed into the empires of Macedonia, Egypt, and Syria, and then by the Roman Republic. Rome achieved unity by conquest and maintained it for many centuries.

In the Middle Ages, western civilization was again divided into many separate states. But, as each in turn accepted Christianity,

western Europe became, in theory at least, a single community united by a common creed and common principles of conduct, and subject to the Roman pope and Roman emperor who were responsible to God, the invisible king. The notion that any one country could be responsible to itself alone had no place in Christendom. When, however, the Middle Ages ended with the revival of Greek learning and the disruption of the church, the belief that the pope had a right to obedience from all Christians was given up; the idea of the independent sovereign state reappeared; and the Christian message of the fatherhood of God and the brotherhood of man was ignored under a narrow and exaggerated nationalism.

Sixty or more of these independent sovereign States were still in existence during the 19th cent. But scientific discoveries were changing the social life of the peoples, who came to depend more and more on one another for their food, clothes, and raw materials. Measured by the time it took to get from place to place, the world was shrinking fast. The journey from Rome to London, for instance, occupied the same number of days—ten or twelve—in 1834 as in the Roman era; but it could be made in a tenth of that time by 1934. The shrinking world became increasingly hard to manage by sovereign states acting independently. So, while in 1815 there was no public international organization, no single authority through which governments could join in looking after world affairs, 33 public international organizations had been forced into existence by 1913. They were concerned with public health, posts, telegraphs, wireless, and other activities in the handling of which "conflicting national interests" had to give way to world interests.

War Branded as a Crime

A central organization to link them emerged from the First Great War. War had hitherto been tolerated as the last arbiter between sovereign states. That seemed reasonable when Wellington could defeat Napoleon at Waterloo (and so settle the fate of Europe for a generation) with no more than 35,000 British and 40,000 allied troops. But when transport could feed and clothe the whole manhood of a nation in the field; and when destructive power had been increased by poison gas, aeroplanes, tanks, and great guns, so that more than a million Imperial troops died in the First Great War, it seemed to most people when the war ended in 1919 that war between nations ought to be branded as a crime and suppressed. Woodrow Wilson, president of the U.S.A., made a league of nations his fourteenth point when he outlined the terms on which he thought the Allies could make peace. A league meant, in practice if not in theory, some abatement of the sovereignty of the leagued states, and many governments were not ready to renounce any of their sovereign rights. But President Wilson persisted, ably supported by Lord Robert Cecil and General Smuts; and the covenant of the League of Nations became the first chapter of each of the peace treaties.

The covenant opened thus :
THE HIGH CONTRACTING PARTIES,
 In order to promote international co-operation and to achieve international peace and security
 by the acceptance of obligations not to resort to war,
 by the prescription of open, just, and honourable relations between nations,
 by the firm establishment of the understandings of international law as the actual rule of conduct among governments, and
 by the maintenance of justice and a scrupulous respect for all treaty obligations in the dealings of organized peoples with one another,
 agree to this covenant of the League of Nations.

The first seven articles of the covenant described the league's membership and machinery. Beginning with 42 member states, the league expanded until it included more than 60, containing more than four-fifths of the population of the globe. Every member state was represented in the league's assembly and, as a general rule to which there were exceptions, could veto any of its decisions. The assembly met once a year from 1920 to 1939 and then, for the last time, in 1946. The league's council, with the great powers as permanent members and four lesser states chosen in rotation, and with the same voting rule as the assembly, met, as a rule, three times a year, but more often if occasion required. The secretariat was always at work in Geneva, the seat of the league. The permanent court of international justice was constituted by the league's first assembly in Dec., 1920, and functioned at The Hague; of all the organs of the league, it was the most widely appreciated.

Articles Embodying League's Aims

The next two articles related to the reduction and limitation of national armaments by international agreement as the first step to peace and security. But nervous nations would not reduce their forces unless their security was guaranteed in case they were attacked. Thus collective security was the concern of the 10th article and of the 16th and 17th.

The 11th enacted that "any war or threat of war is a matter of concern to the whole league, and the league shall take any action that may be deemed wise and effectual to safeguard the peace of nations." The 12th-15th articles inclusive offered just and peaceful means of settling international disputes, including conciliation and arbitration as well as decision

by a court of law. Then followed four articles on preserving and altering treaties. It was part of the league's business to alter as well as to preserve, so as to adapt the existing order to changing conditions.

After that came three articles (22 to 24) about international cooperation in all kinds of business that concern most nations and cannot be managed by state governments acting independently of one another. Two more articles, one promising support for Red Cross organizations and the other dealing with amendments, completed the covenant.

When the League started work in Jan., 1920, the U.K., France, and Italy were the only great powers among its member states. The treaties, each including the covenant, secured a majority in the U.S. senate, but not the two-thirds majority required by the constitution for the ratification of treaties, and the U.S.A. remained out of the league, although its govt. and some of its leading citizens took part in many league activities. Germany was admitted in 1926, and withdrew in 1935. The U.S.S.R. was admitted 1934.

Disputes that were Settled Peacefully

For 11 years the league prospered. Broadly speaking, it gave the nations what they wanted most: a growing sense of security. When disputes occurred, justice could be had without recourse to a display of belligerence by the disputants. Thirty-eight political disputes came before the league during 1920-30. Twenty-three were settled peacefully and justly; in three the league actually stopped war after fighting had begun, while others involved areas which might have become battlefields if the league had not settled the disputes in the initial stage. In 13 no settlement was reached, or there was a settlement outside league procedure. The two remaining disputes were settled after 1930 by dictation of one of the parties.

This succession of peaceful settlements made it seem that no great change was needed to establish security on a firm foundation by international guarantee. A beginning was made when, after two abortive efforts—the draft treaty of mutual assistance rejected by the British (Labour) govt. in 1924, and the Geneva protocol turned down by the British (Conservative) govt. in 1925—Britain and Italy joined in the Locarno treaties with Germany, France, and Belgium to

ensure the defence of the frontier between Germany and her western neighbours against aggression from either side.

The Locarno treaties came into force in 1926 when Germany was admitted to the league. They were followed, on the initiative of the French foreign minister Briand and the U.S. secretary of state Kellogg by the pact of Paris, or Kellogg Pact (*q.v.*). By this treaty, which came into force in July, 1929, 63 states, including the U.S.A., renounced war as an instrument of national policy and pledged themselves never to seek the settlement or solution of their disputes except by pacific means.

League's Failure to Control Japan

Fortified by the brightening prospect of the defence of each by the strength of all, the members of the league began to plan disarmament. But before the disarmament conference called for 1932 met the tide had turned. The turning point occurred in 1931. While Europe and the U.S.A. were weakened and preoccupied by economic depression, a body of Japanese conspirators invaded Chinese Manchuria against the orders of the Japanese govt. By quick and vigorous cooperation with that govt., the league and the U.S.A. might have stopped the invasion. But no such action was taken; a militarist govt. followed in Japan; and four great provinces were wrested from China. The U.S. secretary of state Stimson afterwards declared that his administration had been willing, not only to collaborate with the league, but also to act in advance of the league. At the time, however, the British govt. did not feel sure enough of U.S. support to lead the league in restraint of Japan and protection of China.

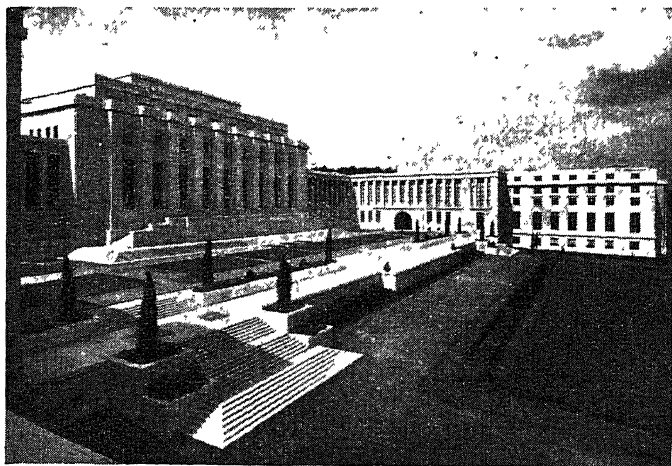
The failure to stop Japan in 1931 and 1932 had disastrous consequences. It led directly to the failure of the disarmament conference at Geneva. It put an end to German participation in the league. It caused the fall of Brüning's govt. and the rise of Hitler to supreme power in Germany. It tempted Mussolini to emulate in Africa Japan's success in Asia.

Whatever excuses there may have been for the league's failure to stop Japan's aggression in Manchuria, they did not apply to Italy's aggression in Abyssinia. The British fleet in the Mediterranean was strong enough, even alone, to deny Mussolini access to the Suez canal. But, after a talk

with the French prime minister, and inquiry of the British foreign secretary whether Great Britain had "any interests" in Abyssinia in Jan., 1935, Mussolini was convinced that neither France nor Great Britain would fulfil their obligations under the covenant. He therefore felt free to fight, to conquer, and to annex. Meanwhile, President Roosevelt did not let the U.S.A. stand idly by. Within two days of the crossing of the Abyssinian frontier by Italian troops in Oct., 1935, he warned the citizens against continuing to trade with either belligerent. He thus proclaimed that, whatever the league might do to enforce peace, it need fear nothing from the U.S.A. But the league did no more than apply economic and financial pressure to the aggressor. The Second Great War might have been prevented if the members of the league had

France gave guarantees to Poland and, shortly afterwards, extended them to Rumania and to Greece. That was the end of appeasement. But Hitler did not believe it, and invaded Poland on Sept. 1. On Sept. 3, Great Britain and France declared war.

The league's economic and social services continued throughout the war and were handed on in 1946 to the United Nations. Their social, economic, and humanitarian work was a positive and constructive contribution to the world's welfare. Much of it was undertaken by the International Labour Organization with its separate offices at Geneva. (Every member of the league was also a member of the I.L.O.; and, when F. D. Roosevelt became president in 1933, the U.S.A. accepted membership of the I.L.O. without joining the league.)



League of Nations. Part of the Palace of the League at Geneva; the buildings, which cover an area of 4½ acres, passed into the possession of the United Nations in April, 1946

Courtesy of Association des Intérêts de Genève

acted with courage and loyalty to that body on this occasion.

Hitler saw his opportunity and seized it, moving his troops into the demilitarized Rhineland zone in March, 1936. Appeasement became the policy of members of the league who believed that, after the failure of economic sanctions against Italy, it would be dangerous to meet the growing threat of European war by the methods of collective security; and appeasement encouraged aggression. Hitler entered Austria in March, 1938; gained northern frontiers (Sudetenland) of Czechoslovakia in Oct.; seized Prague and Memel in March, 1939. On March 31, 1939, Great Britain and

These economic and social activities, prescribed in article 23 of the covenant, included efforts to secure and maintain fair and humane conditions of labour; caring for women, sick persons, and young children; protecting strangers, sojourners, and other minorities in many lands. Much was done by the league, with the help of the I.L.O., to improve labour conditions, notably in China, India, Japan, Persia, and Egypt. Public health owes a great deal to the league's fight against epidemic diseases, such as cholera, plague, and typhus, and to its special efforts in particular countries: China and Yugoslavia, for

instance. The league brought under control the traffic in opium and other dangerous drugs. One of the league's organizations was concerned with transit and communications not only between different countries but also within state boundaries. And the league cared for displaced persons: more than a million refugees from Asia Minor were provided with houses and put in the way of productive work, mainly in N. Greece. One of the most valuable of the league's social services was its work under article 22 of the covenant, designed by General Smuts to help certain backward races by making them a "sacred trust for civilization" and placing them, by means of "mandates," under the supervision of the league.

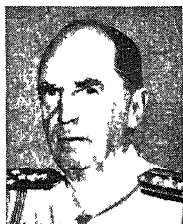
Education Excluded

The league's social services did not include education. The Paris peace conference from which the league emerged made no attempt to enlist the resources of education in order to promote international cooperation and achieve international peace and security, and the league never filled this gap in its covenant. Moves were made in the league's first two assemblies. Nothing came of them save the creation of the international committee of intellectual cooperation which brought together in Paris leading *savants* from all over the world. This was all to the good; but it had little effect upon the education of average men and women in world loyalty and world citizenship. Dame Edith Lyttelton persuaded the fourth assembly (1923) to resolve that young people should be made aware of the existence and aims of the League of Nations and the terms of the covenant; but the stimulation of teachers to undertake this task was left to unofficial bodies, such as the League of Nations Union in Great Britain, save where an exceptionally enlightened minister such as Lord Eustace Percy acted on his own account.

But when the League of Nations met April 8-18, 1946, at Geneva in its 21st and last assembly to hand over to the United Nations, the league had realized that the peoples of the world must be educated in world citizenship. Viscount Cecil of Chelwood (Lord Robert Cecil), one of the league's founders, again representing the U.K., said: "In the end it is public opinion that counts. . . . In the end the last word will be spoken by the great mass of the people. . . . Education in the

largest sense is necessary. Everywhere organizations exist for that purpose, whether supported by the state or drawing their strength from the conviction and enthusiasm of individuals. I venture . . . to press upon my hearers that here is a great work for peace in which all can participate."

Leahy, WILLIAM DANIEL (b. 1875). American sailor and diplomatist. Leahy was born at Hampton, Indiana, May 6, 1875, and graduated from the naval academy, Annapolis, in 1897. He was promoted admiral in 1936, and was chief of naval operations the following year. He retired in 1939, but in 1940 was nominated ambassador to the Vichy French government. After the reinstatement of Laval in 1942, Leahy was recalled to become chief of staff to the president, attending the conferences at Quebec, Cairo, and Teheran. Now fleet admiral, he continued as military adviser to the president when H. S. Truman succeeded Roosevelt. He came to England in 1946 to discuss the repatriation of Japanese forces from Pacific areas under British command.



William D. Leahy,
U.S. sailor and
diplomatist

Leakage and Breakage. Commercial term for certain risks incidental to the transport of goods by sea. Bills of lading and charterparties commonly contain a clause exempting shipowners from liability for damage caused to goods by leakage and breakage while on board their vessels. Leakage is also the technical term for a percentage allowance made for loss or waste by the leaking of casks.

Leamington. A mun. bor. and inland watering-place of Warwickshire, England; in full, Royal Leamington Spa.



Leamington arms

It stands on the Leam, 2 m. E. of Warwick and 98 m. N.W. of London, with two rly. stations. With Warwick it forms a co. constituency. It makes cooking ranges, and has light industries, but its main industry is providing for visitors. Leamington has a royal pump-room, with baths and gardens, and another pump-room called after the earl of Aylesford.



Leamington, Warwickshire. Jephson Gardens and the Royal Pump Room in this residential resort and spa

The other chief buildings are the church of All Saints, the modern town hall, with free library and school of art. Jephson Gardens commemorate the doctor who popularised the place. Leamington is a hunting centre, while near are Kenilworth and other places of interest and beauty.

The town was incorporated in 1875, and is governed by a mayor and corporation. The early name was Leamington Priors, from association with the priory at Kenilworth, but in 1838 the town was named Royal Leamington Spa, by permission of Queen Victoria, who had just visited it. The springs are mentioned by Camden and Dugdale, although they were little used before 1786. Pop. est. 35,000.

Leamington. A town on Lake Erie, in Essex co. in the extreme south of Ontario, Canada. It is reached by rly. from Windsor, 35 m. to N.W. The centre of a district noted for growing tobacco and early fruits and vegetables, it numbers among its industries the Canadian plant of H. J. Heinz and Co. Pop. 5,858.

Leander. In Greek legend, the lover of Hero. To visit her he used to swim the Hellespont every evening. See Hero.

Leander Club. English rowing club, the premier of its kind. It was founded about 1818, being a union of two earlier clubs, the Star and the Arrow. All the leading oarsmen belong to it, and the club puts crews on the water at Henley and elsewhere. The headquarters are at Putney.

Leap Year. Term used for a year which has 366 days; i.e. it contains February 29, which the ordinary year does not. It occurs every time the date of the year is divisible by 4, except that the last year of the century is not a leap year unless the date is divisible by 400. Thus 1900 was not a leap year, but 2000 will be. The name is due to the fact that any given

date after Feb. 29 "leaps" two days down the week instead of one from the day on which it fell the year before. A solar year contains 365 days, 5 hours, and 48 minutes. Taking this as 365½ days, a day was added by Julius Caesar every four years to absorb the additional 24 hours.

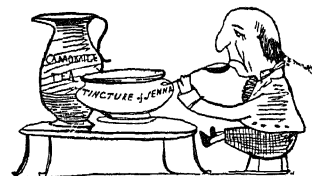
and originally inserted after Feb. 24 (see Bissextile). The Julian calendar erred by 3 days in 400 years, so this was set right by the Gregorian calendar. See Calendar.

Lear, EDWARD (1812–88). A British author and artist. Born in London, May 12, 1812, of Danish descent, he began his working life as a zoological draughtsman, but from 1836 devoted himself to landscape painting. Thenceforward he spent much time in Italy and the Levant, and issued books of travel illustrated by himself. His fame rests chiefly on his Book of Nonsense, 1846, which he undertook in the first instance to amuse the children of the earl of Derby. These rhymes, based on the limerick (q.v.), retain their popularity with all who enjoy dreamlike absurdity. Other books in the same vein are More Nonsense Rhymes, 1871, and Laughable Lyrics, 1876. Among Lear's characters are the Jumbles, the Pobble, and the Dong with a Luminous Nose. He died at San Remo, Jan. 30, 1888.



Edward Lear,
British author

Consult E. L., Landscape Painter and Nonsense Poet, A. Davidson, 1938; Complete Nonsense of E. L., ed. H. Jackson, 1947.



There was an Old Man of Vienna,
Who lived upon Tincture of Senna;
When that did not agree, he took
Camomile Tea,
That nasty Old Man of Vienna.

Edward Lear. Illustration and verse from his Book of Nonsense

Lease (Lat. *laxare*, to let go). Term used in English law. It means the letting of land or some interest in it for a fixed term of years, or for the life of the lessor, or the lessee, or of some other person or persons, or from year to year, or at will. The person who grants the lease is called the lessor, and the person to whom it is granted the lessee. A lease does not become complete until the lessee has entered into possession.

Leases usually contain covenants by the lessee to pay rates and taxes, to repair and keep in repair the premises, to pay the rent whether legally demanded or not. There is generally a proviso that if the lessee fails to keep his covenants the lessor may determine the lease and re-enter the premises. Before such a forfeiture can be enforced, except for non-payment of rent, the lessor must now serve a notice on the lessee giving notice of the breaches complained of, and requiring them to be made good; and only if the lessee fails to comply with the notice can a forfeiture be enforced. In every case where forfeiture is incurred, the court may on application allow the lessee to make good his default and save the forfeiture, on payment of compensation and costs and expenses. (See Landlord.) Dwelling-houses let on lease in which the rent is less than two-thirds of the rateable value do not come within the scope of the Rent Restriction Acts.

A lease taking effect in possession for not more than three years at a rent equal to the full annual value may be made by word of mouth. A lease for over three years must be by deed under the Law of Property Act, 1925. An agreement to grant a lease for whatever period must be evidenced by writing or it will be unenforceable at common law under the same act, which re-enacted the Statute of Frauds, 1677. But if the lessee under such an agreement has entered into possession he will by the rules of equity, which now prevail over common law rules, be in as good a position as if he had a lease.

Leasehold. Name given in England to land which is held on a lease. Since 1925 leasehold is one of the two legal estates, the other being freehold. A normal period of a building lease is 99 years, but leases for 999 years are known. At the end of the period the land, together with any buildings erected thereon, reverts to the grantor of the lease or his successors. Lease-

hold property is regarded as personal, not as real, estate. See Freehold; Land Laws.

Lease-Lend. Term used for the system of mutual aid which developed among the United Nations during the Second Great War. The system began as help by the U.S.A. to Great Britain. President Roosevelt announced what he called his "lease and lend" plan to aid Great Britain at a press conference Dec. 18, 1940; and the act of congress of March 11, 1941, under which the president was empowered "to sell, transfer, exchange, lease, lend, or otherwise dispose of any defence article" to the govt. of any country "whose defence the president deems vital to the defence of the United States," was popularly called the Lease-Lend Act. Before its passage, under the Neutrality Act of Nov. 4, 1939, arms could be exported from the U.S.A. to a belligerent only if paid for in cash and carried in non-American bottoms. By the end of 1940, Great Britain's dollar resources were almost exhausted, and the passing of the Lease-Lend Act, described by Winston Churchill as "the most unsordid act in history," marked a turning point in the war.

After the U.S.A. became a belligerent in Dec., 1941, that country and Great Britain entered, Feb. 23, 1942, into an agreement for mutual aid, based on the Lease-Lend Act, and in the course of the war a network of such agreements was made between Great Britain or the U.S.A. on the one hand and

most of the other Allies on the other. Aid provided by the U.S.A. reached a total of \$40,000,000,000, comprising arms, ammunition, aeroplanes, ships, food, etc. The aid provided by Great Britain totalled £2,078,500,000, of which £1,241,500,000 went to the U.S.A., chiefly in services, accommodation, food, and equipment for the U.S. forces in Great Britain and also in shipping services, notably the loan of the Queen Mary and the Queen Elizabeth for the transport of U.S. troops. British aid to Russia totalled £318,000,000; to Poland £228,000,000; to France £106,000,000. Canada's contribution totalled \$4,000,000,000, rather more than half of it to the U.K.; and Australia's contribution was £A250,000,000, chiefly in the form of food, services, and accommodation for U.S. forces in Australia. At the height of the war the United Nations were aiding one another to the extent of some £4,000,000,000 a year; this mutual aid, by reducing transport of goods, was an important element in Allied victory.

The Lease-Lend Act was a war measure, and President Truman announced on Aug. 20, 1945, that lease-lend shipments ceased forthwith. Negotiations between the Allies followed for the settlement of outstanding commitments. Great Britain's final indebtedness to the U.S.A. was agreed at \$650,000,000, which sum was included in the loan of \$4,400,000,000 negotiated by Lord Keynes in the autumn of 1945. See Loan.

LEATHER AND ITS MANUFACTURE

J. R. Blockey, M.Sc., Principal, Leathersellers' Technical College

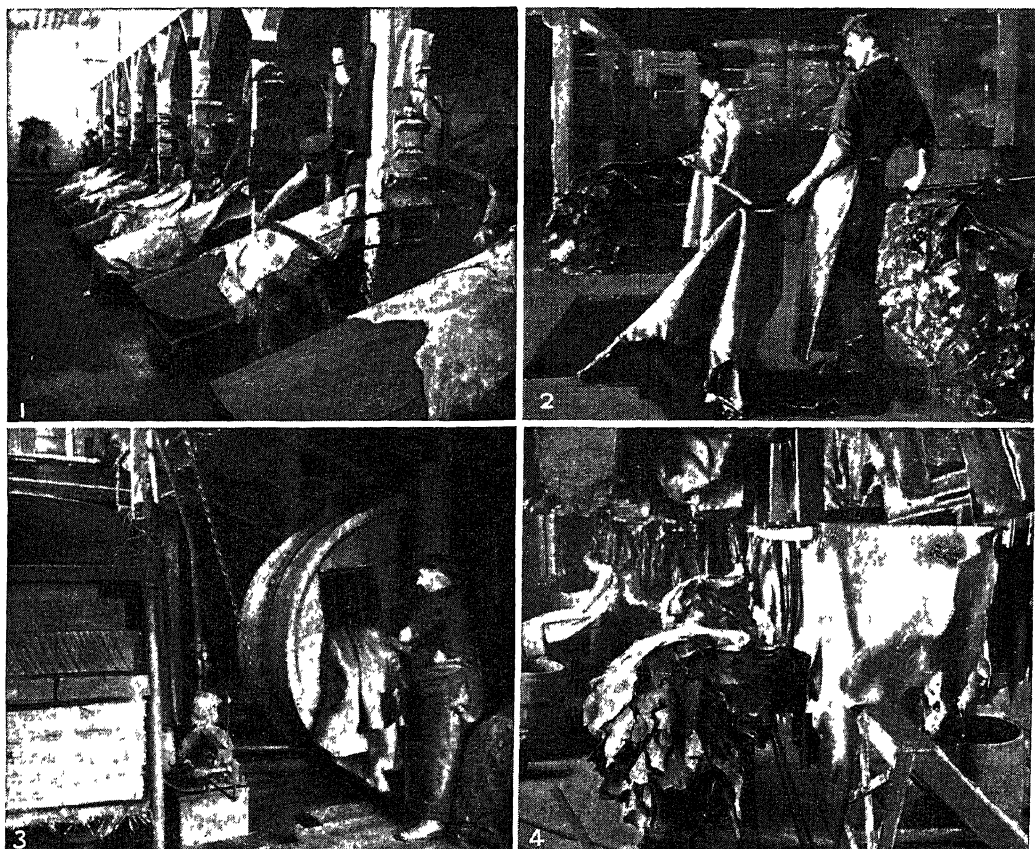
How the raw hides and skins of animals are turned into the many types of leather used for industrial purposes and clothing

The making of leather from the hides and skins of animals is as old as history, for man early found the value of skins as a protection for himself against the weather and scratches. Many of the methods still used for making leather have their origins in the empirical methods of centuries; but the 20th cent. has seen the application also of science and machinery to leather manufacturing.

In the leather industry, the term hide is used for the covering of large animals such as adult cattle and horses, the term skin for that of smaller animals, such as calf, sheep, goat, pig. Leather is also made from the skin of reptiles (crocodiles, lizards, snakes) and fishes, e.g. the shark. Generally speaking, leathers made from

hides are used in the heavy leather industry for, e.g., boot and shoe soles, belting, mechanical and hydraulic leather; leathers made from skins are used in the light leather industry, for boot and shoe uppers (box calf, glazed kid), book-binding, fancy leather goods, upholstery, gloves, etc.

The hide or skin on the animal's back is soft and flexible and almost three-quarters of its weight is water. It would, in this state, be suitable for some purposes such as foot covering or clothing, but it would have the serious drawback that if it dried out it would become horny and hard, and if it did not dry out it would rot through bacterial action. One of the main functions of the tanner, therefore, is to make from skin a material which will not



Leather. Processes in the manufacture of leather. 1. Cleaning the hides on sloping beams. 2. Hides being removed from the tanning vats. 3. Placing hides in the oiling drum to soften them. 4. Leather being dried and finished

rot, will retain its flexibility, and can be subjected to wetting and drying without detriment.

Methods used for converting skin into leather vary according to the type of raw material and the kind of leather to be made, but most kinds of leather go through somewhat similar stages:

(1) Preparation of the skins for tanning by washing or soaking, removal of the hair or wool, removal of some of the connecting tissues (fat, flesh, etc.), softening of the skin by chemical processes.

(2) The actual tanning, to convert the putrescible skin substance into something permanent.

(3) Drying and finishing, which may include applying oils or fats and dyestuffs, and mechanical operations such as rolling, glazing, embossing.

PREPARATION OF SKINS. As received by the tanner, the hides or skins are (a) as removed from the animal, that is still moist, soft, and flexible, and usually sprinkled with common salt to prevent decay; (b) dried out

after being treated with common salt or brine; (c) dried out, that is, hard and horny, without other treatment.

After he has inspected and sorted the skins, the tanner's aim is to bring them back as closely as possible to their condition when on the animal's back. A skin is washed either in pits or clean water or in revolving drums or paddles to free it from extraneous matter such as salt, blood, and dung, and to allow it to absorb water. If it has been dried out, with or without salt, the process takes longer than if it has been only salted, since it needs more time to pick up its lost moisture and so become soft and flexible again. The next operation is the preparation for the removal of the hair or wool by immersion in solutions of lime or other chemicals, or painting the flesh side of the skins with a pasty mixture composed of lime and sodium sulphide. The first method is used for hides and many types of skins with hair on,

the second for sheepskins with wool on, as the wool is often of more value than the skin and is not seriously damaged by this method. A third method still used to a certain extent for sheepskins is the so-called sweating process, in which the skins are hung up in warm damp rooms, where putrefactive changes loosen the roots of the wool.

Then comes the removal of the hair or wool. Valuable wool is "pulled" by hand over sloping beams, and the different grades of wool are carefully sorted. Hair may be similarly removed by hand over a beam by the use of an unhairing knife, which merely scrapes away or separates the hair from the grain side of the skin; but it is usually done by a machine the rapidly revolving steel bladed cylinders of which work on the grain side of the skin as it lies cushioned on a rubber-covered cylinder or bolster. Unhairing machines can deal with a thousand hides a day. When treated in drums with lime and

sulphide, the hair is loosened, pulped, and automatically removed.

Most hides and skins still have adhering to the flesh side certain tissues which the tanner does not want, and therefore after being unhaird they are "fleshed" by highly complicated and efficient fleshing machines.

Pre-Tanning Processes

Almost all the materials used to prepare skins for unhairing are alkaline. As most tanning media are acid, the skins (now "pelts") are next subjected to further processes called deliming, bating, puering, pickling, etc., to make them suitable for tanning proper. With heavy hides, for sole leather, for example, the lime on the surface is removed or neutralised by immersion in weak solutions of acids such as boric. Skins for soft or flexible leathers are put through a bating or puering process by immersion in a warm infusion, formerly of hen or dog dung, now of synthetic materials which act more quickly and give more certain and controllable results.

METHODS OF TANNING. The three chief types of tanning in use are vegetable, mineral, and oil tannage. Vegetable tannage produces the well known brown coloured leather whose chief use is for boot and shoe soles. Many barks, woods, leaves, and fruits of trees contain materials which would convert skin into leather. Perhaps the best known in Great Britain is oak bark, on which the reputation of British sole leather was built. As the amounts available became small in proportion to needs, the world was scoured for other suitable materials, the chief found being quebracho, an extract prepared from the wood of a S. American tree; mimosa bark, from S. Africa and Kenya; myrabolanus, a nut from India; valonia, the cup of the acorn from Asia Minor; sumach, the ground-up leaves of a Sicilian shrub.

Synthetic tannins, chiefly from coal, e.g. condensation products of formaldehyde and cresol, are increasingly used; they produce not only effects similar to those of the natural vegetable tannins, but also new ones, such as those of whiteness and fastness to light.

In vegetable tanning the prepared pelt is usually passed through a series of liquors of gradually increasing strength, the length of time of immersion depending on the thickness of the skin and varying from a few hours for a thin split sheepskin to many

months for a stout cattle hide for sole leather. Heavy hides are usually suspended in pits sunk in the ground; lighter types are often tanned by mechanical means, e.g. revolving drums and paddles.

Mineral tannage is almost entirely a development of the 20th cent. The chief tanning agents are soluble salts of the metal chromium, particularly bichromate, and they are used for the majority of shoe upper leathers (box and willow calf, and glazed kid), for glove leather, and for some of the more specialised mechanical leathers. Chrome tanning is much quicker than vegetable tanning and produces quite different effects, such as a greenish blue colour, and a leather more resistant to both heat and moisture. The skins are either (1) first immersed or drummed in acidified solutions of bichromate, followed by a reduction process using sodium thiosulphate in which the bichromate is converted into basic chromium sulphate, which produces the tanning action; or (2), the more common method, treated directly with solutions of basic chromium sulphate. Some of the greatest developments in tanning have concerned the chrome process.

Other Forms of Tanning

Combination tanning, which is frequently used, involves vegetable and chrome tanning materials. "Semi-chrome" leather is made by superimposing chrome salts on leather already vegetable-tanned; this is often done in the U.K. where skins from abroad, chiefly India (the so-called E.I. or East India stock), have already been tanned by native tanners using indigenous materials. When the vegetable tannins are superimposed on chrome tanned leather the process is called chrome-retan; in the U.K. it is used only for special effects.

In oil tannage, the prepared skins are treated with such fish oils as cod liver or whale oil, which is forced into the skins by mechanical action. Skins are then hung in warm rooms when the oil oxidises and produces compounds of an aldehyde character which have the property of tanning. The surplus oil is removed by pressing and washing. The resulting leather is very soft and usually yellowish in colour. "Chamois" leathers are made by this process, not from the skin of the chamois itself but from the flesh split of a sheepskin.

FINISHING PROCESSES. The skin is now leather, but certain

finishing operations must be carried out. Drying is one such operation, as all tanning methods are carried out on wet skins. Before drying, nearly all leathers have oil or grease applied to them. Vegetable sole leather may merely have the surface wiped with oil before it is dried, but in most cases the oil is applied as an emulsion by mechanical drumming. The types of emulsion used vary considerably. Most leathers are not finished in their natural tanned colours, but are stained or dyed either by hand or, more commonly, by drumming the leather in solutions of dyestuffs. Particular colours, in the form of soluble dyestuffs or pigment, are sometimes applied to the surfaces of leather by spraying, and probably more changes have taken place in this method of leather finishing than in any other. Often the dyes or pigments applied to the surfaces of leather are mixed with a binding material such as casein. Finishes incorporating cellulose are also used.

Machinery used in leather finishing includes rolling machines to make sole leather firm and compact; glazing machines to put a gloss on upper leathers; embossing machines to impart printed surfaces; buffing machines to form the nap on suede leathers.

Bibliography. Tanning Materials, A. Harvey, 1921; Principles of Leather Manufacture, H. R. Procter, 1922; Manufacture of Chrome Leather, M. C. Lamb, 1923; Hides and Skins, J. R. Arnold, 1924; Leather Dressing, M. C. Lamb, 1925; The Chemistry of Leather Manufacture, J. A. Wilson, 1929; Tanning Processes, A. C. Orthmann, 1945; Chemistry of Leather Manufacture, McLaughlin and Theis, 1945.

Leatherhead. Town and urban dist. of Surrey, England. It stands on the Mole, 18 m. S.S.W. of London, with which there is connexion by rly. and Green Line. The church dedicated to SS. Mary and Nicholas is presumed to date from the reign of Edward the Confessor; in Domesday it belongs to the Manor of Ewell. Here also are S. John's school founded for the sons of C. of E. clergymen, and some picturesque old houses. Industries include the making of cables and vacuum cleaners. A modern development is that of the British Coal Utilisation Research Association. Near are Box Hill and other beauty spots of the North Downs. Leatherhead is regarded by many as the Highbury of Jane Austen's Emma. Pop. 25,815.

Leather-Jacket. Name given to the larva or grub of the common crane-flies (*Tipula*) and related species. They live at the roots of grasses and other plants, especially in poorly drained areas. When fields are ploughed up, leather-jackets often damage potatoes, cereals, and other crops. In gardens they are sometimes injurious to carnations, pansies, etc., and to lawns. See Larva illus.

Leathers, FREDERICK JAMES LEATHERS, 1ST BARON (b. 1833). British industrialist. He was born Nov. 21, 1833, and started his business career at 15. When 33 he was managing director of a firm of colliers and shipowners. He worked with the ministry of Shipping during the First Great War, and was minister of War Transport, 1941-45. Leathers was made a peer in 1941 and created C.H. in 1943. He was chairman of Wm. Cory & Son, and on the boards of the P. & O., Westminster Bank, Guardian Assurance, and Tunnel Portland Cement.

Leathersellers' Company. London city livery company. Its first by-laws were framed in 1398,



Leathersellers' Company arms

and its first charter, granted in 1444, bestowed a general right of search for faulty wares throughout the kingdom, a right limited by the charter of 1604 to the city and its precincts. In 1502 the Glovers-Pursers, and in 1517 the Pouchmakers, were amalgamated with the Leather-sellers. With estates at London Wall, Bishopsgate, Lewisham, and Sydenham, the company has contributed largely to educational and philanthropic work. The site of its first hall is covered by Copthall Avenue. By the John Haselwood bequest of 1544, it was enabled to convert the Nuns' Hall of the old priory of S. Helen's, Bishopsgate, into a place of assembly; this structure was demolished 1799. The company's next hall, in Little St. Helen's, was burnt in 1819, and a fourth hall was built in 1822. In 1878 the fifth was erected in St. Helen's Place, Bishopsgate; in 1926 a new court room and offices were added. In May, 1941, the buildings were seriously damaged by fire, following a German air raid, but the company's charters and plate were saved. Consult History and Antiquities of the Leather-sellers, H. W. Black, 1871.

Leatherstocking. Nickname of Natty Bumppo, the principal character in Fenimore Cooper's *Leatherstocking Tales*. He is a partly European, partly Indian, scout, noted for his knowledge of nature in all its moods and his coolness in the face of danger. Possessing the best qualities of the two races, he acts as a link between them. He first appeared in *The Pioneers* (1823), and ended his career in *The Prairie* (1827).

Leatherwood (*Dirca palustris*). Shrub of the family Thymelaeaceae. A native of N. America, it is much branched and tree-like, but only 2 to 6 ft. high, and has lance-shaped, alternate leaves. The light yellow, funnel-shaped flowers are in clusters of three or four, and precede the leaves. The bark of the stem is fibrous and very tough, so that the Indians use strips of it for thongs. Other names for it are wicopy and moosewood.



Leatherwood. Spray of the North American shrub

Leathes, STANLEY (1830-1900). A British scholar. Born at Ellesborough, Bucks, March 21, 1830, son of the rector, he was educated at Jesus College, Cambridge. Ordained in 1856, he served as curate in Salisbury and London, and in 1863 was made professor of Hebrew at King's College, London. He was a member of the revising committee of the O.T., 1870-85, and during 1880-1900 held livings, first at Cliffe-at-Hoo, Kent, then at Much Hadham, Herts. Hulsean lecturer at Cambridge in 1873 and Bampton lecturer at Oxford in 1874, he published *Studies in Genesis*, 1880; *Foundations of Morality*, 1882. He died April 30, 1900.

His son, Sir Stanley Mordaunt Leathes (1861-1938), was educated at Eton and Trinity, Cambridge, where he became fellow and lecturer. During 1903-07 he was secretary to the civil service commission, and in 1907 became a commissioner; three years later first commissioner. He was one of the editors from 1902 of *The Cambridge Modern History*, and among his writings is *The People of England, 1915-16*. Knighted in 1919, he died July 25, 1938.

Leave. Permission granted to an officer, n.c.o., or man in the Royal Navy, British army, or R.A.F., to be absent from quarters for a period exceeding 24 hours.

Without a permit called a pass (army and air force form 295B and navy form 822) a sailor, soldier, or airman out of quarters is liable to be taken into custody and charged with being absent without leave. Officers are given leave verbally and carry no permit.

There are embarkation and disembarkation leave, sick leave, and compassionate leave. In peace the normal leave amounts to 28 days per annum, taken in two periods of 14 days. During the Second Great War, men stationed in Great Britain received annually

four periods each of 7 days, plus a 48-hour pass. Aircrew received a 7-day period of leave every six weeks while on home stations. Troops serving overseas were granted local leave as circumstances allowed, and towards the close of the war home leave was

given according to length of service overseas. Leave is always subject to exigencies of the service; it is a privilege, not a right.

Leaven (Lat. *levare*, to raise). Substance that causes fermentation or modification. In bread-making, fermented dough, added to fresh flour and baked, results in leavened bread. The words leaven and leavened often occur in the Bible, the Hebrew word being derived from a root meaning to be agitated. Among the Israelites the use of leavened bread was forbidden in connexion with divine worship (Ex. 12 & 13; Lev. 2), except for the two loaves for the priests (Lev. 23). The shew bread and the Passover cakes were unleavened, as were all cereal offerings. In the N.T. the word leaven is used figuratively, as in Matt. 13 and Luke 13, for the influence of Christ, and in Matt. 16 for the doctrine of the Pharisees and Sadducees; in 1 Cor. 5 the words old leaven refer to the spirit in the Church which is indifferent to sin, as well as to the unchaste sinner. The figurative is now the principal use of the word leaven, connoting any strong, silent influence. See Bread; Yeast.

Leavenworth. City of Kansas, U.S.A., the co. seat of Leavenworth co. A flourishing commercial centre on the Missouri river, it is 25 m. N.W. of Kansas City, and is served by numerous rlys. Its chief buildings are the R.C. cathedral of the Immaculate

Conception, the government building, the hospitals, and charitable institutions. Fort Leavenworth, to the N., is one of the most important military posts of the western states; it has a massive bronze statue of Grant. A busy distributing centre, Leavenworth has collieries, packing establishments, machine shops, flour mills, and wagon works, and manufactures bricks, machinery, furniture, soap, and stoves. Founded in 1854, when it was the capital of Kansas Territory, Leavenworth became a city in 1855. The city's penitentiary is famous for the strike led by conscientious objectors in 1919, when the prison was for two months governed by a committee of sentenced men, and mutineers were taken to Alcatraz, San Francisco. Pop. 19,220.

Leaves of Grass. Collection of poems by Walt Whitman (*q.v.*). First published in 1855, in a small volume of 94 pages, and republished ten times with alterations and additions, it marked a new departure in American poetry. At first the public saw only the weeds, but a letter of commendation from Emerson, printed in the second edition, attracted more favour, and the unequal and in parts chaotic work, in which the author tried to express his democratic ideals as naturally as the grass grows, came to be accepted as a stimulating message to humanity. Whitman sacrificed rhyme and metre and used a remarkable freedom in expression, but retained a regard for rhythm. The work was influenced to some extent by Oriental transcendentalism.

Lebanon. Mountain range in Syria. It extends at an average distance of 20 m. E. from the Mediterranean, running about 95 m. N.E. to S.W. It is separated from the parallel E. chain of Anti-Lebanon by the valley of the Buka'a, the ancient Coele-Syria, part of the Great Rift (*q.v.*), through which the river el-Asi (Orontes) flows N., and the Litani S. The average height of the range is 6,000 to 8,000 ft. though Zahr-el-Kazib in the N. exceeds 10,000 ft. The white colour of the calcareous rocks gives its name to Lebanon (Semitic *laban*, to be white). The mountains, pierced by deep gorges, are arid except near perennial streams, and little is left of the famous cedar forests. The range is also called Libanus.

There are about 60 references to Lebanon in the O.T. At Solomon's request Hiram, king of Tyre, sent men to Lebanon to hew cedar, fir,

and "algum" wood, which was transported in rafts along the coast and used to build the temple (1 Kings 5, *vv.* 6-10; 2 Chron. 2, *v.* 8). Cedar was also brought hence for the second temple (Ezra 3, *v.* 7). In the prophets, psalms, and canticles, poetic imagery is



Lebanon. Valley of the Kadisha, a mountain torrent in a gorge of the Syrian mountain range

often drawn from the great cedar forests, "the glory of Lebanon," *e.g.* Ps. 104, *v.* 16; Isa. 10, *v.* 34; and from the snow and cold streams of the mountains (Jer. 18, *v.* 14, Cant. 4, *vv.* 8-15).

Lebanon. A republic of S.W. Asia, bounded W. by the Mediterranean, N. and E. by Syria, and S. by Palestine. The territory comprises the 20-mile-wide coastal plain and the two mt. ranges of the Lebanon and Anti-Lebanon, with the Buka'a valley between them; the total area is 3,475 sq. m. Its geography is described in the preceding article. Most of the towns and villages are built on the high ground, for the coastal belt is torrid; here, however, are the seaports of Beirut (the capital) and Tripoli, also ancient Tyre and Sidon, now of little importance. The ruins of Baalbek are on the Syrian border. Lebanon produces silk, olive oil, wheat, and wine; iron in the N., lignite in the S., and gypsum are mined.

Turkey first granted a constitution to Lebanon in 1861, after nearly twenty years of civil war, and at the instance of the Powers a Christian governor was appointed; but these privileges were abrogated in 1916. After the First Great War it became a separate country under French mandate. In June, 1941, Allied (including Free French) troops under Gen. Catroux entered the country to

counter German activities, and removed the Vichy French administration. Catroux appointed a president and declared Lebanon a sovereign independent state in Nov. Allied forces, however, remained in occupation, the last withdrawing in Dec., 1946. Lebanon was an originating member of the Arab League (*q.v.*).

The inhabitants, mainly Arabs but with many foreign elements, Turks and Circassians, Armenians, Jews, etc., number 1,047,745. The majority are Sunni Muslims, with a strong Christian element. Of the country's 986 schools, 811 are Christian; there are 326 schools organized by Europeans, and Beirut has French and American universities. Roads and rlys. are good; during the Second Great War the Allies built a standard-gauge line linking Beirut with Haifa and thence with Egypt. This was later extended to Tripoli, the terminus of the Iraq oil pipeline. See Khoury; Syria map. Consult Syria and Lebanon, A. K. Hourani, 1945.

Lebanon. City of Pennsylvania, U.S.A., the co. seat of Lebanon co. Situated 25 m. E.N.E. of Harrisburg by rly., it lies in a valley rich in magnetite, iron ore, limestone, brownstone, and brick clay. Manufactures include nuts and bolts, chains, and steel goods; the Bethlehem Steel Co.'s plant is here. A town from 1820, Lebanon became a city in 1885. Pop. 27,206.

Lebas, Jacques, Philippe (1707-83). A French engraver. A Parisian, born July 8, 1707, he studied under Hérisset and Tardieu. Beginning with the French painters, Lancret, Boucher, Watteau, Chardin, and Greuze, and proceeding to the Dutch and Flemish



J. P. Lebas, French engraver

masters, Rembrandt, Teniers, and Rubens, he produced plates that were remarkable for their spirit and clever technique. Among his pupils were the English engravers, Robert Strange and Henry Ryland. Lebas's success was not unchallenged by critics, but he established a reputation, especially in landscapes and small figures. He died in Paris, April 14, 1783.

Lebensraum (Ger. living-space) Word used as a slogan by the Nazis under Hitler, to justify their claim to expansion on the ground that the population of Germany

was too great in proportion to her arable land. This claim was linked with the doctrine of agricultural self-sufficiency, which demands that a country must produce all its food from its own soil. The cry for *Lebensraum* was raised in protest against the "encirclement" of Germany by powers thought to be potentially hostile, and in support of the German demand for a sphere of influence in S.E. Europe.

Lebesgue, HENRI (1875-1941). French mathematician, born at Beauvais. He became a professor at the Collège de France in 1921 and a member of the French Academy of Sciences in 1922. The method he devised for finding a measure for an arbitrary set of points is known by his name. He died Aug. 6, 1941, at Vichy.

Leblanc, MAURICE (1864-1941). A French writer. Born at Rouen, Dec. 11, 1864, he worked in his father's shipyards there, and later settled in Paris. His first novels met with little success, but in 1906, at the behest of a newspaper editor, he wrote a crime story, *Arsène Lupin*, and established his reputation as one of the leading mystery writers of his time. Books introducing this ingenious criminal which made his creator internationally famous, included *A. L., Gentleman-Cambrioleur*, 1907; *A. L. contre Sherlock Holmes*, 1908; *Les Trois Crimes d'A. L.* *Arsène Lupin* was translated to the stage and screen. Leblanc died at Perpignan, Nov. 6, 1941.

Leblanc, NICHOLAS (1742-1806). French chemist. Born at Issoudun, Dec. 6, 1742, he studied medicine and chemistry. In 1775 his attention was attracted by the offer of a prize by the French Academy for a method of making soda from salt, on account of the shortage of the marine plant barilla from which it was mainly being obtained. From 1787, following a suggestion of Méthérie that soda might be obtained by the action of sulphuric acid and heating the product with charcoal, Leblanc seriously investigated the problem. He hit upon the idea of adding chalk to the charcoal, and in 1791 started the first artificial soda factory, the foundation of a huge modern industry. During the Revolution, Leblanc's factory was confiscated; when it was returned to him in 1799 he was too poor to restart work, and on Jan. 16, 1806, he committed suicide. The process he invented brought great fortunes to many, but since 1884 it has been largely superseded by the Solvay process. See Alkali.

Lebœuf, EDMUND (1809-88). A French soldier. Born in Paris, Nov. 5, 1809, he served in the army with distinction in Algeria, at Sevastopol, and in the Italian campaign of 1859. In 1869 he became minister of war. In that capacity Lebœuf, promoted marshal in 1870, made the historic and incorrect statement on the eve of the Franco-Prussian War that the French army was prepared to the last gaiter button. He was taken prisoner with Bazaine at Metz and after the war retired from public life, dying June 7, 1888.

Le Bourget. The airport of Paris is entered as Bourget, Le.

Lebrija. Town of Spain. In the prov. of Seville, it is the ancient Nebrissa Veneria. It stands on the left bank of the Guadalquivir, near the Marshlands (Marismas), 29 m. direct and 44 m. by rly. S. of Seville. Its chief church was originally a mosque and is built in a variety of styles, Gothic and Renaissance predominating, and contains some curious statues and carvings. There are a ruined Moorish castle and a lofty tower, in imitation of the Giralda at Seville. The clay of the neighbourhood is used for making bricks, tiles, and pottery, and from numerous olive trees in the vicinity the finest oil in Spain is produced. There is trade in cattle, wine, and grain. Pop. 14,300.

Lebrun, ALBERT (1871-1950). French president. He was born Aug. 29, 1871, at Mercy-le-Haut, Meurthe-et-Moselle. Educated at the Ecole Polytechnique, he became a mining engineer and soon a professor. Entering politics as a deputy of the moderate



Albert Lebrun,
French president

Right in 1900, he kept his seat until 1920; he was vice-president of the chamber in 1915, having been minister of the colonies in different governments since 1911 and shown tact and firmness over the Agadir incident (*q.v.*). Senator from 1920, Lebrun represented France at the League of Nations in 1921; acted as vice-president of the senate 1925-29; as president 1931; and was elected to succeed Doumer as president of the republic in 1932. A crisis was averted in 1934 when Lebrun called a national government into being to stop the Paris

riots. He was re-elected in 1939, and so was in office in 1940, when France succumbed to Hitler. He eschewed the Pétain-Laval administration. Arrested by the Gestapo in 1943 and held until liberated by the Allies, he retired from public life in 1944. He made a state visit to Britain in March, 1939. He died March 6, 1950.

Le Brun, CHARLES (1619-90). A French painter. He was born in Paris, Feb. 24, 1619, and studied under his father, a sculptor, and Poussin, whom he accompanied to Italy in 1642.



Charles le Brun,
French painter

On his return, he was employed by Fouquet at the château of Vaux, and having been introduced to Louis XIV, designed or painted many of the royal decorations at Versailles. He founded the Royal Academy of the Fine Arts in 1648, and the French school at Rome in 1666. First director of the Gobelins factory, he died in Paris, Feb. 12, 1690. See Fountain, illus.

Lebrun, MARIE LOUISE ELIZABETH VIGÉE (1755-1842). French painter. She was born in Paris,



Elizabeth Vigée Lebrun, from a self-portrait in the Uffizi Gallery, Florence

April 16, 1755, and in 1776 married Jean Baptiste Lebrun, painter and picture dealer. Her talent soon made her a fashionable portrait-painter. In 1779 she produced her first portrait of Marie Antoinette, and in 1782 was admitted to the Academy. The Revolution drove her abroad, but in 1815 she was back in Paris, where she established a salon. She died March 30, 1842. One may cite her portraits of Mme. de Staël as Corinna, Miss

Pitt, two of Lady Hamilton, and of herself and her daughter, in the Louvre and National Gallery.

Le Caron, HENRI (1841-94). A British secret service agent. He was born at Colchester, Sept. 26, 1841, his real name being Thomas Miller Beach. As Le Caron he served through the American Civil War, attaining the rank of major. While thus employed he joined the Fenians, and in 1866 supplied the British government with information which enabled it to thwart the plan for a Fenian invasion of Canada. From this date until 1889 he was an agent of the British and Canadian governments.

Military organizer of the Irish Republican Army in the U.S.A. in 1868, he secured the failure of the Fenian invasions of Canada in 1870 and 1871. He then negotiated between the constitutional and revolutionary groups of Irish nationalists, supplying valuable information to Scotland Yard. When he was subpoenaed as a witness for *The Times* before the Parnell Commission in 1889 his activities were revealed and he retired, dying April 1, 1894. *Consult* *Twenty-five Years in the Secret Service*, 16th ed. 1893.

Le Cateau or CATEAU CAMBRÉSIS. Town of France. It stands on the Selle in the department of the Nord, 15 m. S.E. of Cambrai. Its chief buildings are a 17th century church and the town hall. Originally two villages, it owes its present name to the 11th century castle built by the bishop of Cambrai. It was then part of Flanders, becoming French in 1678, and here a treaty was signed between France and Spain in 1559.

Le Cateau was the scene of an early battle of the First Great War, and also gave its name to another and longer battle, fought over a much wider area, towards the close of that war. The first battle was fought between British and Germans, Aug. 26, 1914, during the British retreat from Mons. The retreating forces of the British 2nd Corps, reaching Le Cateau on Aug. 25, were so fatigued that Smith-Dorrien, their commander, decided to stand and fight a delaying action. Sir John French, British c.-in-c., did not agree with this decision, preferring a quick retreat. He warned Smith-Dorrien to expect no support.

Smith-Dorrien's corps faced four German corps, and German cavalry was advancing on front and flanks. On Aug. 26 German artillery attacked along a line from Le Cateau to Caudry, about 10 m.

Outmatched by some 600 guns to 246, the British batteries were gradually silenced, and a general retirement was ordered during the afternoon. In the withdrawal British battalions suffered severely. The 1st Gordons did not receive the order to retire, and lost 80 p.c. of their strength. British artillery, covering the withdrawal, which was otherwise successfully completed, lost 225 men and 38 guns. Total British losses were about 9,000 out of fewer than 50,000 men engaged. German losses were approximately equal. Moreover, the Germans were not ordered to pursue until the following morning, thus affording the British the respite they required. But Smith-Dorrien was afterwards severely censured by Sir J. French.

The second battle was fought in Oct., 1918, with British forces twenty times as large as those engaged in the first, namely 20 British divisions, with 2 U.S. divisions and 2 cavalry divisions, against 24 German divisions. The object was the capture of Cambrai and of German defences on the W. bank of the Selle. British 3rd and 4th armies attacked Oct. 8, on a front between Cambrai and Sequehart to the S., with the French 1st army on their right also advancing. To the S. they advanced six miles, and enveloped Cambrai. Roads converging on Le Cateau became blocked by disorderly masses of German transport and troops, and these were bombed. The British 1st army then advanced from

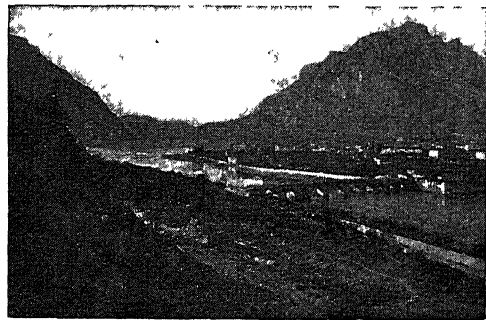
the N. Canadians crossed the Schelde canal and met British patrols in the evacuated Cambrai. Beyond that town the British swept into open country, with the Germans in flight before them. The 4th army reached a front close to Le Cateau, while the 3rd army reached the line of the Selle north of that town, occupying Caudry. On Oct. 10 and 11 bridgeheads over the Selle were secured, and the battle may be said to have closed on Oct. 12, having resulted in the capture of 12,000 German prisoners and 250 guns, with a wide tract of important ground. A deep bulge was driven into the German front, necessitating the evacuation by Ludendorff of

further important territory in Flanders.

Lecce. Maritime prov. of S.E. Italy, in Apulia. Formerly known as Terra d'Otranto, it lies between the Adriatic Sea and the Gulf of Taranto, and is bounded on the N. by the provs. of Brindisi and Taranto. Its area is 2,645 sq. m. The surface is generally hilly, with lowlands near the sea. The soil is fertile, and among the chief products are wine, oil, cereals, and fruit. Numerous cattle are reared on the hilly pastures. Lecce contained many ancient cities, e.g. Brundisium, Tarentum, and Naretum, but the modern towns are comparatively small, Lecce, Gallipoli, Galatina, and Nardo.

Lecce. A city of Italy. The capital of the prov. of Lecce, it is the ancient Lupiae. It stands about 8 m. from the Adriatic coast, 23 m. by rly. S.S.E. of Brindisi. It has many 17th century baroque churches, and one founded by Tancred in 1180. The prefecture, originally a convent, now houses a fine collection of terra-cottas and vases. Pop. 49,261.

Lecco. Town of Italy, in the prov. of Como. It stands on the Lake of Lecco, 32 m. by rly.



Lecco, Italy. The town and lake of Lecco from the south-west. On the right is Mt. S. Vittore
Frits

N.N.E. of Milan. The river Adda is here spanned by a fine bridge, built in 1335 and reconstructed in 1609. A manufacturing town, Lecco has iron, copper, and brass works, silk, cotton, wax candle, and wood-carving factories, and oil mills. The scene of Manzoni's *I Promessi Sposi*, it has a statue of the poet. Pop. 29,000.

Lech. River of Austria and Germany. Rising in the Vorarlberg, and flowing mainly N. through Bavaria, it enters the Danube near Donaauwöth, after a course of 180 m. Unnavigable, its rapid flow provides water power. Augsburg is on its banks, and its chief tributary is the Wertach. The Lechfeld, the plain where the two unite, was

the scene of the defeat of the Magyars in 955 by Otto the Great, and in 1632 Gustavus Adolphus forced the passage of the river against the army of Tilly, who was mortally wounded here. The river was the boundary between the medieval duchies of Swabia and Bavaria.

Lecithin. Group of white waxy substances, chemically phosphatides, which turn yellow or brown on exposure to air. The lecithin from egg yolk (ovolecithin) and from soya bean is best known. Lecithin is prepared from egg yolk by extraction with alcohol or ethyl acetate and precipitation from the concentrated solution by adding acetone. It is used in medicine in neurasthenia and various nervous diseases.

Lecky, WILLIAM EDWARD HARTPOLE (1838-1903). A British historian. Born in co. Dublin,



March 26, 1838, the son of an Irish landowner, he was educated at Cheltenham and Trinity College, Dublin. He studied divinity, but turned to historical research, and in 1860 wrote his

With Lecky

first book, *Religious Tendencies of the Age*, soon followed by *Leaders of Public Opinion in Ireland*. In 1863 appeared an essay on *The Declining Sense of the Miraculous*, subsequently expanded into his *History of the Rise and Influence of Rationalism in Europe*, which, published in 1865, at once established his reputation. A *History of European Morals*, 1869, in which he showed the progressive character of moral institutions, was equally successful.

His greatest work, *The History of England during the Eighteenth Century*, appeared in eight large volumes during 1878-90. It took rank as a classic, is remarkable for impartiality, and remains the best existing record of the social and political activities of the 18th century, or more correctly of 1760-93, for the earlier part is but a sketch. The most valuable portion, the chapters on Ireland, appeared separately in five volumes as *A History of Ireland in the 18th century*. The narrative of the years before the Union in 1800 constitute Lecky's greatest achievement. His other works include the pessimistic sketch *Democracy and Liberty*, 1896; *The Map of Life*,

1899; and the posthumous *Historical and Political Essays*, 1908. He was Unionist M.P. for Dublin university, 1895-1903, and died Oct. 22, 1903, a foundation member of the Order of Merit. *Consult* biography, J. J. Auchmuty, 1946.

Leclanché Cell. In electricity, a form of wet or dry cell for the production of electricity by chemical action. It was devised by Georges Leclanché in 1868. *See* Cell and *illus.* p. 1884.

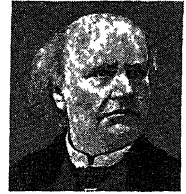
Leclerc, JACQUES (1902-47). A French soldier. Of a noble Picard family, he was born Philippe, Viscount of Hauteclouque. He studied at St. Cyr, entered the cavalry, and in 1934 became an instructor. Wounded and captured by the Germans in 1940, he escaped to join Gen. de Gaulle, and was sent to the Cameroons to secure their adherence to the Free French. He adopted the name Leclerc for fear of reprisals against his family in France. In 1942 he led a mixed French and native force 1,500 m. across the Sahara from Fort Lamy (Chad Territory) to join in the Mareth Line battle, an exploit which had great moral value for France. Commanding the French 2nd armoured div., the first troops to enter Paris, he received there the German surrender, Aug. 25, 1944. As c.-in-c. French Indo-China, his vigorous methods helped to quell the nationalist rising, and he negotiated the agreement with Vietnam in 1946. Inspector of combined French forces in N. Africa, he was killed in an aircraft accident, Nov. 28, 1947. He was buried in the Invalides, Paris.

Leconfield, BARON. British title held by the family of Wyndham since 1859. The 3rd earl of Egremont, dying without legitimate sons, left his great wealth to a natural son, George Wyndham (1787-1869), who, in 1859, was made Baron Leconfield.

The third baron, Charles Henry, was born Feb. 17, 1872, and succeeded to the title in 1901. The family estates are mainly in Sussex, and the chief residence is Petworth (*q.v.*).

Lecote de Lisle, CHARLES MARIE RENÉ (1818-94). French poet. He was born Oct. 22, 1818, in the island of Réunion. He withdrew from political activity to devote himself to literature, and became the acknowledged master of the Parnassian school, which, in reaction against the subjectivity and extravagances of romanticism, proclaimed the impersonality of art and the supreme value of form.

These doctrines are embodied in his *Poèmes Antiques*, 1852; *Poèmes Barbares*, 1862; and *Poèmes Tragiques*, 1884, which are characterised by classic restraint and a sculptural beauty of style, as well as by intellectual force, pessimism, and



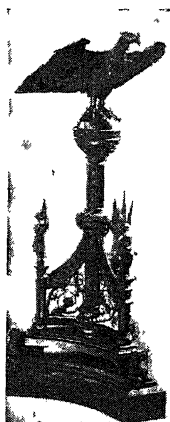
Lecote de Lisle,
French poet

a profound feeling for nature. He made admirable translations from Theocritus, Anacreon, Homer, and Horace. He died July 18, 1894, having been an Academician eight years. *Consult* L. et ses Amis, F. Calmettes, 1902.

Le Corbusier, CHARLES ÉDOUARD (b. 1887). Swiss architect. Born Jeanneret-Gris, Oct. 6, 1887, he was the son of a watchmaker at La Chaux de Fonds. He attended the local academy of arts and crafts, later working in Paris. One of the foremost exponents of functionalism, he introduced such innovations as glass façades and elevated traffic passages, and was the first to impress architectural character to ferro-concrete. He gave effect to the theory that architecture is primarily a matter of convenience and health by his use of the flat roof with roof-garden. His work in town planning included schemes in Algiers, Barcelona, Buenos Aires, and Nemours. In Paris his outstanding buildings were the Salvation Army project, 1931; and the Swiss Foundation, 1932. Le Corbusier also designed a number of private houses, notably the Maison Laroche at Auteuil. His publications include *Vers une Architecture*, 1922; *Urbanisme*, 1925.

Lecouvreur, ADRIENNE (1692-1730). French actress. Born near Châlons, April 5, 1692, she first appeared at the Comédie Française in 1717 as Electre in Crébillon's tragedy of that name and as Angélique in Molière's comedy *George Dandin*. She early became celebrated for her powers as a tragic actress and refusal to follow the stilted style of the day. In 1721 she became the mistress of Maurice de Saxe. Died March 20, 1730.

Lectern. Reading desk in a church, from which the Epistle and Gospel are read. In medieval churches it stood at the north end of the high altar, and was fashioned of bronze or wood, the Bible generally resting on the back of an eagle with outstretched wings.



Lectern in Exeter Cathedral

During the 17th century it disappeared in England, but has been revived, in brass or bronze, in modern times.

Lectionary. Book or table of lessons. In the Anglican Church the term is applied to the book containing the lessons to be read at matins and evensong as set forth in the calendar in the Book of

Common Prayer. The practice of reading portions of Scripture at divine service began with the establishment of synagogues in Judea, and was adopted by the early Church.

Excepting that attributed to S. Jerome, no extant lectionary dates back farther than the 8th century. The English lectionary was first planned at the Reformation so as to allow of the greater part of the Bible being read through in each year. The existing version came into force Jan. 1, 1879. Consult Smith and Cheetham's Dict. of Christ. Antiq., new ed. 1893.

Lecture (Fr., ultimately from Lat. *legere*, to read). Strictly, the act of reading. The word is now applied specifically to a formal disquisition upon some particular subject delivered orally for purposes of instruction, and more generally, especially in the plural, to classroom instruction by a university professor or lecturer. By the Copyright Act, 1911, it is an infringement of copyright in the lecture to reproduce it or any substantial part of it in public, at any rate if the lecturer was reading his lecture or was speaking from notes. There is no copyright in an extempore speech. A newspaper may publish a report of a lecture unless a conspicuous notice is exhibited prohibiting this; and even then a newspaper may publish a summary.

Lecythis. Genus of S. American trees of the family Lecythidaceae. *Lecythis ollaria* bears the curious fruit known as monkey-pots (*q.v.*).

Leda. In Greek mythology, wife of Tyndareus, king of Sparta. Zeus fell in love with her beauty, and visited her in the form of a swan, as a result of which Leda

brought forth two eggs, from one of which sprang Castor and Pollux, and from the other Helen. See Castor and Pollux; Helen.

Ledbury. Urban district and market town of Herefordshire, England. It is 13 m. E. by S. of Hereford on the railway. Situated to the S.W. of the Malvern Hills, Ledbury is an old-fashioned town, and in the neighbourhood are extensive orchards and hop gardens. The imposing church has a detached tower and a large and beautiful baptistry. Elizabeth Browning passed her girlhood in Ledbury, and John Massfield was born here. Market day, Tues. Pop. 3,283.

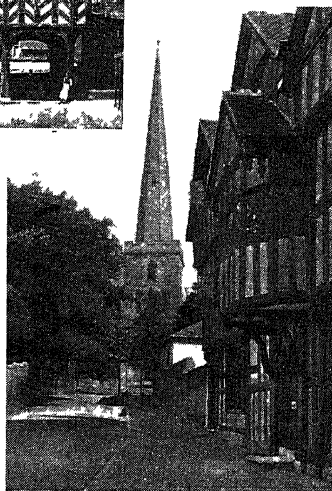
Ledeburite. The eutectic (*q.v.*) alloy formed by carbon and iron. These elements form a series of alloys, ranging from steel to cast iron. If a white cast iron is cooled just below freezing point, ledeburite is formed; this contains 48 p.c. of austenite (*q.v.*) and 52 p.c. of cementite (*q.v.*). When this is cooled further the austenite changes to ferrite and cementite. Some high speed steels may also show the structure of ledeburite.

Ledeganck, KARL LUDWIG (1805-47). A Flemish poet. Born at Eecloo, he took his doctor's degree in law at Ghent in 1835, and was appointed a judge. The previous year he had been awarded a national prize for a Flemish

poem, and he was subsequently commissioned to translate the legal code into Flemish. In 1845 he became professor of literature at Ghent, and was one of the leading spirits in the Flemish movement. Among his poems the best known is *De drie Zustersteden* (the three sister cities), 1846, in which he sang the glories of Bruges, Ghent, and Antwerp. He died March 19 1847.

March 19 1847.

Ledger. Book used for the accounts of a business firm. It is so called because such books were kept lying in



Ledbury, Herefordshire. Church House and tower of the parish church. above, left, the timbered Market House, 1633

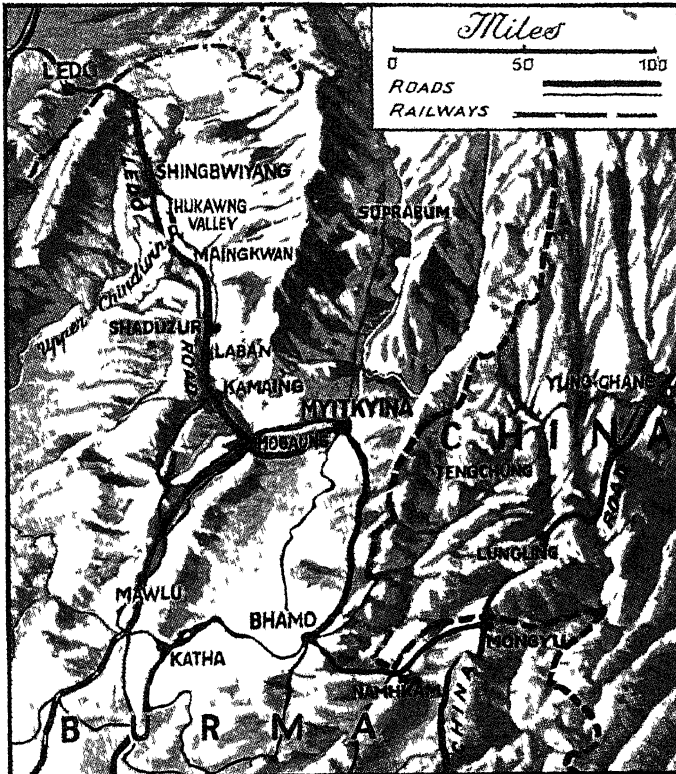
one place (mid. Eng. *leggen*, to lay; *liggen*, to lie). In book-keeping by double entry all the transactions of a firm are recorded and summarised in it. It contains a number of accounts, one each for every buyer and seller, and others for stock, cash, profit and loss, etc. One can thus see at a glance how any account stands. The process of transferring entries to the ledger is called posting. See Book-keeping.

Ledger, OR LEGER, LINES (French, *léger*, light). In music, short lines above or below the long lines of the ordinary musical stave, to extend its compass. Formerly, staves with more than 5 lines were used, but were confusing to the eye.

Ledo Road. Military highway of S.E. Asia, completed in 1945 after two years' work. The highway, later called the Stilwell Road, in honour of the American general



Leda and the Swan. From the painting by Giorgio Vasari, in the Borghese Gallery, Rome



Ledo Road. Military highway of S.E. Asia, completed 1945. It was 478 m. long and joined the old Burma Road into China, forming a new land route from India, across northern Burma to China

who commanded in this theatre, was 478 m. long. From the railhead of Ledo, in N.E. Assam, the road crossed the 5,000-ft. forested Patkai Hills, then ran through jungle country to Shingbwiyang, through the Hukawng valley to Shadzur, Kamaing, Mogaung, and Myitkyina to Bhamo, thence to Namhkam and Mongyu, where it joined the Burma Road. It was abandoned, worthless as a commercial highway, after the Second Great War, Nov. 1, 1945.

The road was constructed by U.S. army engineers, with native labour, behind a spearhead column under Stilwell. This force included two Chinese divisions and a U.S. light brigade, known as Merrill's Marauders. Roadhead was at the front line, and in 1944 the road was the supply line for operations against the Japanese with the objective of opening a new land route to China. During his offensive in N. Burma, Stilwell entered Mogaung on June 26 and Myitkyina on Aug. 4.

Ledru-Rollin, ALEXANDRE AUGUSTE (1807-74). A French politician. Born at Fontenay-sur-Seine, Feb. 2, 1807, he became an advocate and a noted demagogic

agitator, and was elected Republican deputy for Le Mans in 1841, also writing on jurisprudence. At the revolution of 1848 he was, with Lamartine, on the provisional commission named by the constituent assembly in that year. He stood unsuccessfully as Socialist candidate for the presidency, and in 1849 led a body of extremists who occupied the Conservatoire des Arts, but were dispersed by troops. Fleeing to England, he returned under amnesty in 1870, and died Dec. 31, 1874.

Ledum. Genus of small evergreen shrubs comprising three species. They belong to the tribe Rhododendroidae, one of the four divisions of Ericaceae, and are found in Europe and N. America. Possessing narcotic properties, the leaves of *L. latifolium* and *L. palustre* have been used medicinally in dysentery, ague, etc.; from the latter, the marsh wild rosemary, is produced ledum-camphor or ledum-oil. Ledum is also sometimes employed in the tanning of Russia leather. From the use of its leaves as a substitute for tea *L. latifolium* is sometimes known as Labrador tea.

Ledward, GILBERT (b. 1888). British sculptor. Educated at the R.C.A. (where he was professor of sculpture, 1926-29) and the British school at Rome, he became known for his large groups. He was elected R.A., 1937. His works include the Guards' Memorial, Horse Guards Parade, and that to Lord Milner in Westminster Abbey. He executed statuettes of King George VI and Queen Elizabeth in the cloisters of Norwich cathedral, and civic war memorials. The Tate Gallery has his Monolith, 1936.

Ledwidge, FRANCIS (1891-1917). Irish poet. He was born June 19, 1891, in a peasant's cottage at Slane, Meath, and began writing poems while a road-mender. He later worked in a Dublin grocer's shop. In the First Great



Francis Ledwidge, Irish poet

War he served in Gallipoli, Salonica, Serbia, and on the western front, where he was killed in action, July 31, 1917. Ledwidge was a poet gifted in conveying his impressions of the countryside in which he had been brought up. His volumes were *Songs of the Fields*, 1916; *Songs of Peace*, 1917; *Last Songs*, 1918; *Complete Poems*, 1919.

Lee (A.S. *hléo*, shelter). Side of a vessel opposite to that upon which the wind blows, the latter being the windward, or weather side. Hence leeward, on or towards the lee. A lee shore is one towards which the wind is driving a ship. Leeway is the difference to be made up between the course steered by a ship and the course she actually runs when the wind is on the beam.

Lee. River of co. Cork, Eire. It rises in Gougane Barra Lough and flows mainly E. to Macroom, then to Cork. Here it divides into two branches, one on either side of the city, but the two unite and, passing Blackrock and Passage West, the river falls into Cork Harbour between Monkstown and Cobh. On its banks the English settlers built a number of castles. It is 45 m. long and is navigable to Cork. Salmon fishing is available. Consult Lovely is the Lee, R. Gibbings, 1944.

There is also a Lee in Kent; rising near Keston, this flows 10 m. to the Thames at Greenwich. There are a river and loch of this name in Angus, Scotland. The river with the Mark forms the N. Esk.

Lee. S.E. district of London, in the met. bor. of Lewisham, on the river Lee, with a railway station $8\frac{1}{2}$ m. from Charing Cross terminus. The parish church of S. Margaret's is the third of this name here; in the churchyard are tombs of the Fludyer, Roper, and Boone families and the grave of Halley. The estate of The Cedars was formerly known as Lee Grove. Almshouses founded by Christopher Boone in 1683 were pulled down in 1877, but the chapel was left, and near it are almshouses of the Merchant Taylors' Company. The manor, mentioned in Domesday, was given by the Conqueror to Odo, bishop of Bayeux, and passed eventually to the earl of Northbrook. The manor house and grounds were bought by the L.C.C. and the vestry for £8,856, the mansion being used for a free library; the grounds, through which runs the Quaggy, a tributary of the Ravensbourne, were opened to the public in 1902.

Lee, ARTHUR HAMILTON LEE, VISCOUNT (1868-1947). A British politician. Born Nov. 8, 1868, he was educated at Cheltenham and the R.M.A., Woolwich, serving in the artillery until 1900. That year he became Conservative M.P. for Fareham, and was civil lord of the admiralty, 1903-05. In July-Dec., 1916, he was personal military secretary to Lloyd George, and in 1917 became director-general of food production. He resigned in 1918 on a question of agricultural policy, but was soon appointed to the ministry of agriculture. During 1921-22 he was first lord of the admiralty. Created Baron Lee of Fareham in 1918, he was raised to viscount in 1922. He gave his Buckinghamshire home, Chequers (*q.v.*), to be a country residence for every prime minister during his term of office; and was a notable patron of art. When he died, July 21, 1947, the title became extinct.

Lee, ANN (1736-84). The first head of the Shakers (*q.v.*). She was born Feb. 29, 1736, daughter of a blacksmith at Manchester, and was imprisoned in 1770 for open-air preaching of eccentric character. Four years later she emigrated to America, where she founded the American Society of Shakers and established a settle-

ment at Kayuna, near Watervliet, N.Y. She saw visions, and believed herself to be a kind of reincarnation of Christ. Died Sept. 8, 1784.

Lee, JENNIE (b. 1904). Maiden name of Mrs. Aneurin Bevan, British politician. Daughter of a Fife miner, she was born Nov. 3, 1904, and went to Edinburgh university. In 1929 she was elected Labour M.P. for N. Lanark and attracted attention by her outspoken views and her charming manner in debate, but lost her seat 1931. She was returned by Cannock, 1945, with the largest majority for a woman at that election; and reelected in 1950. Her marriage to Aneurin Bevan (*q.v.*) took place in 1934. Tomorrow is a New Day, 1939, is autobiographical.

Lee, JOHN. Central figure of a *cause célèbre*, known as "the man they couldn't hang." See Babbarcombe Murder.

Lee, NATHANIEL (c. 1653-92). English poet and dramatist. He was educated at Westminster and Trinity College, Cambridge. Patronised by the duke of Buckingham, he tried to make a living as an actor in London, but having no gifts for a stage career save elocutionary powers, took to writing plays. He caught the habit of reckless living from Rochester (the Count Rosidore of his Princess of Cleve) and became an inmate of Bethlehem Hospital, 1684-89. He is said to have fallen and been stifled in the snow, returning drunk to his lodgings. He was buried in the church of S. Clement Danes, May 6, 1692.

Lee's work had all the faults of the Restoration dramatists, but is redeemed by the clearness of his plots and his occasional gleams of genuine poetry. With Dryden he collaborated in two blank verse tragedies, Oedipus, 1679, and The Duke of Guise, 1682. Of his own plays, some of which held the stage for many years, the most popular was The Rival Queens, or Alexander the Great, 1677. The others include Nero, 1675; Gloriana, or the Court of Augustus Caesar, 1676; Sophonisba, or Hannibal's Overthrow, 1676, for which Purcell wrote incidental music; Theodosius, 1680; Lucius Junius Brutus, 1681; and Constantine the Great, 1684. Lee's works were collected in three vols., 1722 and 1734.

Lee, ROBERT EDWARD (1807-70). American soldier. Born Jan. 19, 1807, of an old Virginian family, he entered West Point in 1825, and was appointed to the engineers in 1829. Promoted colonel for services in Mexico, in 1852 he was chosen superintendent at West Point. In 1855



Robert E. Lee, American soldier

he saw service against the Indians on the Texas border, and in 1859 led the U.S. troops dealing with the raid on Harper's Ferry. When the civil war began in 1861 Lee was in command of the first U.S. cavalry regiment. Refusing a high command by the Federal government, he joined the Confederates in command of the Virginian levy. During 1861 he acted as military adviser to President Davis.

In 1862, when the Federal general McClellan was threatening Richmond, and Johnston had been wounded at Fair Oaks, May 31, Lee succeeded the latter as commander-in-chief of the army of N. Virginia. Then followed three years of magnificent generalship. His daring strategy at once began to take effect. He called in Jackson's force from the valley to threaten McClellan's flank while he attacked him in front and won a battle lasting June 27-July 3. Lee then decided to manoeuvre McClellan out of the peninsula by a direct advance on Washington. Pope was advancing from the N. on Richmond, but Lee and Jackson entirely defeated him in the battles of Cedar Run, Aug. 9, and the second battle of Bull Run, Aug. 30, and drove him back on Washington. These events forced McClellan to embark his troops to Washington; thus in three months Lee had saved the Confederate capital and was now menacing the Federal. He invaded Maryland, but a new army defeated him at Antietam Creek, Sept. 17, and the Confederates were forced to retire into Virginia.

Lee's greatest victory was Chancellorsville (May 2-4, 1863), but henceforth the waning resources of the South placed him in an ever-growing numerical inferiority. Still he judged it sound to attack; he crossed the Potomac, and advanced into Pennsylvania, but he was checked by Meade in the battle of Gettysburg (July 1-3) and had to retire again into Virginia. When Grant assumed command of



Nathaniel Lee, English poet



Viscount Lee, British politician

the Federal forces, Lee with 64,000 exhausted troops had to meet a ruthless antagonist in command of 140,000 well supplied men.

Nevertheless, when the Federal leader began his smashing campaign of spring, 1864, in the Wilderness, Lee always contrived to keep his men between Grant and Richmond. Twice (May 5 and 10), when the Confederate line was breaking, he placed himself at the head of troops to re-establish the front, and was kept out of close fighting only by the insistence of his men that they would "make good." His health began to break down; he could obtain no fresh troops; and Grant, who was continually reinforced, now made a flank attack on Richmond from the S., and in June began the siege of Petersburg, which brought Lee to a standstill. Too late, on Feb. 18, 1865, Lee was given the general command of all Confederate forces. He had to evacuate Petersburg on April 3, and after six days of desperate fighting surrendered to Grant at Appomattox with 26,000 men. The war was ended.

Chamberlayne said that Lee was "a great soldier, wise in command, patient in preparation, swift in decision, terrible in onset, tenacious of hold, sullen in retreat." He never acted on the defensive of his own will, and was defeated only for lack of means to carry on. None of his opponents out-generalled him. If he had a fault as a soldier, it was that he was kind-hearted, unwilling to supersede incompetent officers, and too submissive to government control. President of Washington College, Lexington, he died there Oct. 12, 1870. See American Civil War.

Bibliography. Four Years with Gen. Lee, W. H. Taylor, 1878; Memoirs of Lee, A. L. Long, 1886; General Lee, F. Lee, 1895; Robert E. Lee, W. P. Trent, 1899; Recollections and Letters, by his son, R. E. Lee, 1904; Lee the American, G. Bradford, 1912; Grant and Lee, Gen. Fuller, 1933; R. E. Lee, D. S. Freeman, 1934; The Gray Knight, B. Moses, 1937.

Lee, SIR SIDNEY (1859-1926). British man of letters. Born in London, Dec. 5, 1859, he was educated at the City of London School and Balliol College, Oxford. He joined in 1883 the editorial staff of The Dictionary of National Biography; in 1890 he became joint editor with Stephen, and in 1891 sole editor, carrying the work to completion and being responsible for two supplements.

His Life of Shakespeare, 1898, is generally regarded as the standard biography; it was revised 1915.

In 1913 he became professor of English language and literature at the E. London College of London university. Knighted in 1911, he was president of the English Association. He died March 3, 1926. In addition to articles in the D.N.B., mainly on the Elizabethans, Sir Sidney wrote Life of Queen Victoria, 1902; Great Englishmen of the 16th Century, 1904; Shakespeare and the Modern Stage, 1906; Life of King Edward VII, 1925-27.

Lee, VERNON (1856-1935). A British writer. Born Violet Paget, she was educated in France, and published her first volume of essays, Studies of the 18th Century in Italy, in 1880. The style and erudition of this book were repeated in further volumes, including Euphorion, Essays on the Renaissance, 1884. Her balanced prose and scholarly intelligence were at their finest in essays on the spirit of places, e.g. Genius Loci, 1898; The Enchanted Woods, 1904; Limbo, 1908. Later works included The Handling of Words, 1923; Music and Its Lovers, 1932. She spent most of her life in Italy, where she died Feb. 13, 1935.

Lee, WILLIAM. English inventor. Born at Calverton, Notts, he graduated at Cambridge, being at Christ's and S. John's Colleges. In 1582 he was ordained, and he held a cure at Calverton, where about 1589 he invented the stocking frame (*q.v.*). He moved to London, and settled in Bunhill Fields, and by improvements of his machine succeeded in 1598 in producing silk stockings, a pair of which he presented to Queen Elizabeth. Driven to France by the jealousy of the English hand-knitters, he settled at Rouen, but political troubles again thwarted his attempts, and he died in Paris.

Leech. Name given to a class (*Hirudinea*) of annelid worms. They possess sucking disks and live upon the blood of other animals. There are a large number of species, inhabitants of sea, fresh water, and marshy land. About twenty species are found in Great Britain, including the horse leech and, less commonly, the smaller medicinal leech. The latter (*Hirudo officinalis*) is common in Germany and Russia, and it is the best known. Its mouth possesses three tooth-like serrated plates, curved so as to form semi-circular jaws which enable the leech to make its typical three-

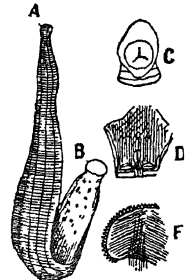
gash wound. The animal sucks the blood of its victim till completely gorged, when it drops off and slowly digests its meal. It secretes a fluid which prevents the coagulation of blood, often making it difficult to check the bleeding after its application.

Leeches are oviparous and hermaphroditic, and vary considerably in size and colour. *Macrobdella valdriana* reaches a length of 2½ ft. and other species vary down to half an inch. The colours are usually black, brown, grey, or dark green. A small variety found in ponds feeds on water snails, while many kinds of fish are attacked by other varieties of leech. In parts of India, Java, Sumatra, and other tropical countries, leeches are often present in moist grass in such numbers as to be a source of danger. See Horse Leech.

Leech, JOHN (1817-64). A British caricaturist. Born in London, Aug. 29, 1817, he was educated at



Charterhouse, and became a medical student at St. Bartholomew's Hospital, but spent most of his times sketching. His first Punch drawing was published in Aug., 1841; his first cartoon, Wellington and the Clown, two years later. He contributed about 3,000 drawings to that periodical before his death, in London, Oct. 29, 1864. Among other works one may cite illustrations to Percival Leigh's Comic Latin Grammar and Comic English Grammar, 1840; Dickens's Christmas Carol, 1844; & Beckett's Comic History of England, 1847-48, and Comic History of Rome, 1852; and Hole's A Little Tour in Ireland, 1858. His pencil work is delicate, sensitive, and well composed. *Consult* Life and Work, W. P. Frith, 2nd ed. 1891; A Little About Leech, G. Tidy, 1931.



Leech. Diagram illustrating the sucking organs of the medicinal leech. A, front, and B, back, sucker. C, front sucker with mouth. D, the same cut open to show the three jaws. E, jaw with toothed edge

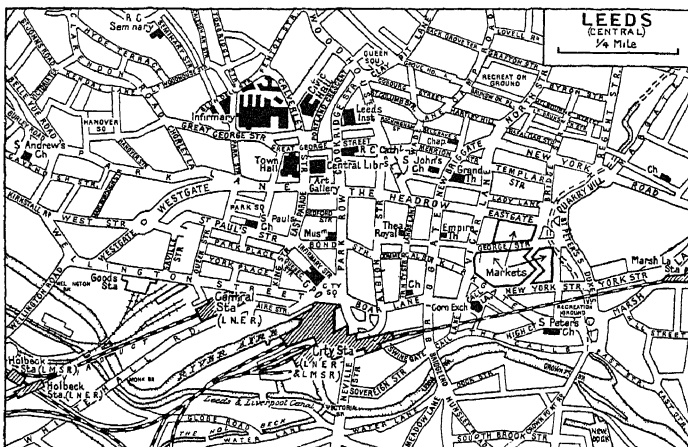
Leeds. City and co. bor. of the W. Riding of Yorkshire. The sixth largest town in England, it stands



Leeds arms

on the Aire, 185 m. N.N.W. of London, and is served by mainly lines from London, having three large stations. It is well served by canals, by which its manufactures are able to reach both E. and W. coasts.

The business area of Leeds is in the streets near the Aire. The city square, with an equestrian figure of the Black Prince and other statuary, may be regarded as its centre. Around are populous suburbs, many being industrial areas. The chief residential suburbs are Headingley, Roundhay, and others to the N. The principal secular buildings are the town hall, opened 1858, the civic hall, opened 1933, the municipal buildings, public library and art gallery, corn exchange, and philosophical hall. In the first named is the Victoria Hall, where the musical festival is held; in the philosophical hall are collections of Roman antiquities, etc. There are a grammar school, a foundation of

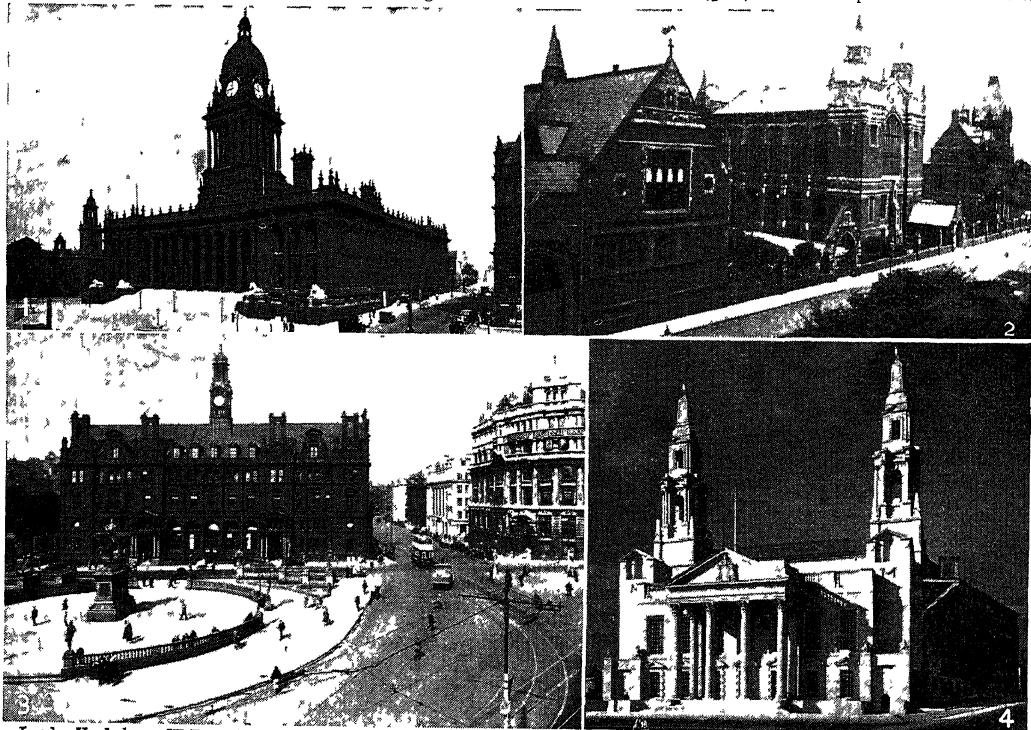


Leeds, Yorkshire. Plan of the central part of the city, showing the principal buildings and the business centre

1552, now housed in a modern building, and several colleges in addition to the university. The city has a fine general infirmary. Of the numerous libraries, that founded in 1768 by Dr. Priestley contains over 80,000 volumes.

S. Peter's, the parish church, is famous for its clergy and influence rather than for its architectural merits. S. John's is a 17th century building with some interesting features. The Roman

Catholics have a cathedral, and there are many Nonconformist churches. There are theatres, the Grand being the chief, cinemas, and clubs. Of many fine parks, the chief are Roundhay (one of the most beautiful public parks in the country) and Temple Newsam; the latter contains a fine mansion dating from 1626. Within the boundary of the city, $3\frac{1}{2}$ m. N.W., are the ruins of Kirkstall Abbey (*q.v.*). The corporation owns the



Leeds, Yorkshire, W.R. 1. Town Hall, opened by Queen Victoria, 1858. 2. University buildings. 3. City Square, showing the General Post Office (with clock). 4. Civic Hall, opened by George V, 1933
1, 3 and 4, Charles R H Pickard & Son, 2, Photochrom

water supply and a splendid system of markets. Electric tramways serve the city and its suburbs, connecting it also with Bradford, Wakefield, and other towns.

The principal of many industries is the manufacture of cloth. Large quantities of clothing are made, and Leeds is a centre of the leather trade, boots and shoes being manufactured. There are large engineering works, breweries, and flax mills. Other articles produced include rope, linen, glass, earthenware, soap, brushes, paper, and chemicals. It has also large printing and lithographic works. Standing as it does on the fringe of the W. Riding industrial district, Leeds possesses the attractive advantage of being within easy reach of delightful rural country in the lower foothills of the Pennines.

Leeds existed in Anglo-Saxon times. About 1200 it became a corporate town, and in the 14th century a centre of the woollen manufacture. In 1626 its first royal charter was given. It did not send members to parliament until 1832 (when it sent two) except briefly under the Commonwealth. Since 1950 it has sent 7. It became a county bor. in 1888, and a city in 1893. In 1897 the mayor was granted the title of lord mayor. In 1912 the city's boundaries were extended to include Roundhay, Shadwell, Seacroft and a part of Crossgates. Further adjustments have increased the area to nearly 60 sq. m. Market days, Tues. and Sat. Pop. est. 502,000.

Leeds. A village of Kent, England, 4 m. E.S.E. of Maidstone. The restored church of S. Nicholas is mainly Early English. In the Middle Ages there was an Augustinian priory here, with a church of remarkable size and beauty. Battle Hall, a 14th century building, still stands. Leeds Castle, about $\frac{1}{2}$ m. from the village, is a fine example of a medieval fortress, much of it dating from the 13th century. It stands on a small island on a branch of the Medway, which thus forms a moat, and has a tower, a gateway, and a drawbridge. It was built by a Crèvecoeur and was at one time the property of the Fairfaxes.

Leeds, UNIVERSITY OF. English university, established in 1904. It replaced the Yorkshire College, one of the constituent colleges of Victoria university. The college was a union, dating from 1884, of the Leeds college of medicine founded in 1831, and the Yorkshire college of science founded in

1874. In 1887 it became a university college, and in 1904 a distinct university. Its faculties include arts, economics and commerce, and law, medicine, science, and technology, while much attention is given to agriculture, engineering, mining, the leather and textile industries, fuel metallurgy, and chemical engineering.

Degrees and lectures are open to women equally with men, and there is an extra-mural department providing extension lectures and tutorial classes. The university has a library, an observatory, departmental museums, and laboratories, as well as residential halls for men and women. Affiliated are the Huddersfield technical college, Rawdon College for training Baptist ministers, and the Anglican College of the Resurrection at Mirfield, the diocesan training college at York, and the printing department of the Leeds technical college. See Gown col. plate.

Leeds, DUKE OF. British title borne by the family of Osborne since 1694. It is taken from Leeds near Maidstone, Kent, not Leeds in Yorkshire, although the estates are in the latter county. The founder of the family was Sir Edward Osborne (d. 1591), lord mayor of London in 1583. His wealth passed to his grandson, Edward (1596-1647), who was made a baronet in 1620. He fought for Charles I during the Civil War. This Sir Edward's son, Thomas, was prominent as earl of Danby in the reign of Charles II, and in 1694 was made duke of Leeds (*v.i.*).

The 4th duke married Mary, daughter of the 2nd earl of Godolphin and granddaughter of the great Marlborough. Francis, 5th duke (1751-99), was a secretary of state under Pitt (1783-89). When the 7th duke died in 1859, the elder line became extinct and the titles passed to a younger branch in the person of Baron Godolphin, a title given in 1832 to a younger son of the 5th duke. John Francis Godolphin Osborne (b. March 12, 1901) became 11th duke, succeeding his father in 1927. An eldest son takes the title of marquess of Carmarthen.

Leeds, THOMAS OSBORNE, DUKE OF (1628-1712). English politician. He was the son of Sir Edward Osborne, a baronet with estates in Yorkshire. Having succeeded to his father's title and estates in 1647, and been taken to court by George Villiers, duke of Buckingham, in 1665 he entered the house of commons as M.P. for York, and appeared as one of Clarendon's

opponents. In 1673, having held minor offices in connexion with the navy, he was made lord treasurer, a baron,



Thomas Osborne,
1st Duke of Leeds
After Van de Vaart

and a viscount. In 1674 he was created earl of Danby.

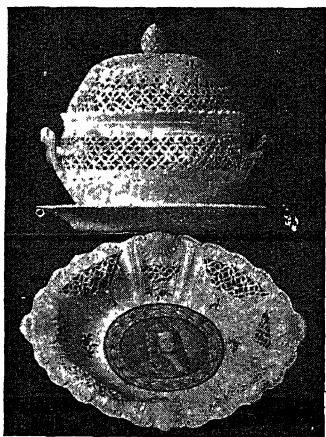
Chief adviser to Charles II, he did not share the king's desire to show leniency to the Roman Catholics, nor agree with his subservience towards France; his line was to trust to the loyalty of the classes who had restored the king, not forgetting the helpful aid of bribery. He did not find it possible to get his own way, but he remained in office, in spite of many rebuffs both in and out of parliament, until 1678. Danby made a bitter enemy of Louis XIV of France, and to this his fall was due. Under protest he had assented to the king's underhand bargains with France, and to ruin him Louis made this known. He was impeached, and so determined were the commons that, when the impeachment hung fire, a bill of attainder was introduced, and in 1679 he was imprisoned in the Tower of London.

Released 1684, he opposed the policy of James II; he signed the invitation to William of Orange, for whose marriage with Mary he had been largely responsible, and did much to rally Yorkshire to the invader's side. In 1689 Danby was made marquess of Carmarthen and in 1694 a duke. In 1689, too, he became lord president of the council, and during 1690-95, his rival Halifax having retired, was William's chief adviser. In 1695 he was again impeached, this time for corruption, but the charge was not pressed. The duke remained fairly prominent in politics almost until his death, July 26, 1712.

Leeds and Liverpool Canal. Artificial waterway opened in 1816, connected with the Bridgewater Canal, Aire & Calder Navigation at Leeds, the river Ribble, and Liverpool docks. Total length, including branches, is 145 m. Barges of 50-60 tons capacity navigate at a draught of 4 ft. throughout the system, which passes through coal producing and industrial areas, there being a regular daily service of motor barges between the towns. Merchandise traffic from Hull and Goole to places on the canal is

trans-shipped at Leeds, but large quantities of coal pass from collieries in Yorkshire and Lancashire to places on the banks. Principal traffic is in coal, grain, groceries, timber, cotton, cement, etc., to the extent of about 1,500,000 tons a year. Storage warehouses are available. The canal rises to nearly 500 ft. over the Pennines; the summit level is fed from reservoirs.

Leeds Ware. Pottery, mostly cream ware, made at the Leeds pottery by the firm of Hartley, Green & Co. As early as 1760 Green was making a black enamelled earthenware, but the best period of Leeds ware is 1775-1820, after William Hartley joined the firm, when an excellent cream ware was produced. Uniform in colour, with a rich creamy glaze,



Leeds Ware. Plate with pierced pattern and painted portrait. Top, bowl and cover of pierced work
Victoria & Albert Museum, S. Kensington

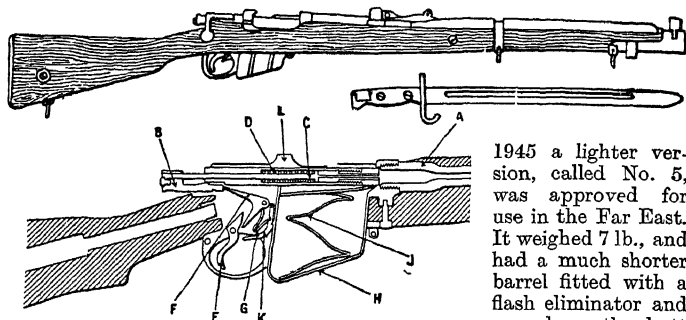
the ware is thin and light, the ornament refined, and the colouring limited to printed designs and a few enamels of subdued tone. Pierced patterns were also employed. The "frog mugs," with a well modelled frog inside, are celebrated.

Lee-Enfield. Standard rifle of the British fighting services. It was developed from the Lee-Metford rifle introduced into the British army in 1888, which incorporated for the first time charger-loading with clips of six rounds. The Metford rifling consisted of seven grooves with increasing twist, but with the adoption of cordite as a smokeless propellant the grooves were reduced to five with uniform twist, and the bolt action improved. The new rifle, termed Lee-Enfield, became the standard British small arm in 1903.

Minor modifications being made, at the outbreak of the First

Great War the standard pattern of all rifle-armed units was that known as the short magazine Lee-

was replaced by an 8.5 in. spike bayonet (*see* Bayonet). Issue of the No. 4 began in 1942. Early in



Lee-Enfield Rifle. Sectional diagram of bolt and trigger mechanism and magazine. A. Barrel. B. Cocking piece. C. Striker. D. Striker spring. E. Trigger. F. Sear. G. Trigger and sear spring. H. Magazine. J. Magazine spring. K. Magazine release catch. L. Charger guide. Above, rifle and bayonet

Enfield, or S.M.L.E. It has a bolt action and a magazine holding ten rounds. A steel spring feeds the cartridges upwards from the magazine, and, the bolt being open, one cartridge is pressed out of the magazine and pushed into the chamber as the bolt moves forward. The double motion of the bolt cocks the rifle, which can be fired as soon as the bolt is home. The withdrawal of the bolt throws out the empty cartridge case. A trained soldier can fire twenty aimed shots per minute.

The rifle has two sets of sights, that for normal use being graduated up to 2,000 yds., while the long range sight is graduated from 1,600 to 2,800 yds., extreme range of the weapon being about 3,700 yds. Weight is approximately 8 lb. 14½ oz.; length 3 ft. 8½ ins.; length of barrel 25½ ins.; calibre 0.303 ins. The mark VII ammunition has a pointed bullet weighing 174 grs. The bullet leaves the rifle with a muzzle velocity of about 2,000 ft. per second. A long sword bayonet can be fitted by a spring catch.

Accurate and efficient, the S.M.L.E. suffered from the defect that it was not suited to mass production. Experience in the First Great War indicated difficulties in maintaining large-scale supplies. In 1926 designs were approved of a new type known as the No. 4. Although the basic principles of mechanism and magazine were retained, the number of parts was reduced and simplified to assist mass production, while the barrel was made heavier and shorter, increasing the weight of the rifle by 3½ oz. over that of the S.M.L.E. The long sword bayonet

1945 a lighter version, called No. 5, was approved for use in the Far East. It weighed 7 lb., and had a much shorter barrel fitted with a flash eliminator and a pad on the butt to reduce the effect of recoil. It had a hunting knife type of bayonet 8 ins. long. Neither No. 4 nor

No. 5 was as accurate as the S.M.L.E.; but the Second Great War provided few opportunities for individual marksmanship. *See* Ammunition; Bullet; Cartridge; Rifle.

Leek (*Allium porrum*). Hardy bulbous biennial plant of the family Liliaceae. Closely related to the onion, this vegetable is more delicate in flavour and aroma. It is raised from seed sown at any time during spring, and transplanted in rows in shallow trenches or in holes a foot apart. Leeks want plenty of water, and during growth

the earth should be banked up around them at intervals in order to keep the stems white and tender. Leeks should be lifted at the first sign of frost and stored away for winter use in a cool shed. The leek is worn as an emblem by Welshmen on St. David's day, March 1, in memory, it is said, of that saint's advice to the British to distinguish themselves thus from their Saxon enemies in a battle. Some, however, regard the daffodil as the true Welsh leek. *Consult* Shakespeare's King Henry V, iv, 7, and v, 1.



Leek, leaves and root

Leek. Market town and urban dist. of Staffordshire, England. It stands on the river Churnet, with a railway station, 13 m. S.S.E. of Macclesfield. A branch canal connects it with the Trent and Mersey Canal. The church of Edward the Confessor is a fine 14th century edifice. In the church-

yard is a cross of unusual type, possibly Danish. All Saints is a modern building. There is an old grammar school and an institute with an art gallery, library, etc. The chief industries are the manufacture of silks, ribbons, and similar goods.

On the estates of the earl of Chester, Leek became a borough in the 13th century, but that privilege was not maintained. The silk industry was introduced in the 17th century, and at one time the place was famous for its ale. Leek gives its name to a county constituency of Staffordshire. About $1\frac{1}{2}$ m. to the north of the town are the ruins of the Cistercian abbey of Dieularesse, founded in the 13th century, and the hamlet of Rudyard, with its lake, 2 m. long. Pop. 19,500.

Lee-on-the-Solent. A village of Hants, England, in the bor. of Gosport. It is on the E. side of Southampton Water, about 12 m. S.E. of Southampton. The R.A.F. Marine station here was handed over to the Fleet Air Arm in 1937. In 1947 a scheme was put forward by the Southampton Harbour Board for construction at Lee of an international marine airport with a base for land planes, at a cost of over £5,000,000.

Leer. Tn. of E. Friesland, Lower Saxony, W. Germany. At the confluence of the Leda and Ems, it is a river port and a rly. junction. A manufacturing and market town, it produces textiles; it is also a shipping centre with a harbour opened in 1903. Leer has shipbuilding yards, and exports agricultural and other produce. It belonged to Prussia during 1744-1807 and 1866-1945. Pop. 13,383. *Pron. Lair.*

Leese, Sir Oliver William Hargreaves (b. 1894). British soldier. Born Oct. 27, 1894, he



Sir Oliver Leese,
British soldier

was educated at Eton and served throughout the First Great War, receiving the D.S.O. He was deputy chief of the general staff to the B.E.F. in 1940 and commanded the 15th (Scottish) div. and the Guards armoured div. in 1941. Promoted lieutenant-general in 1942, Leese went to the Middle East, commanding the 30th corps, 8th army, from Alamein to Tunis and through Sicily. He succeeded Gen. Montgomery as commander

of the 8th army, Jan. 5, 1944, holding this post until, following the prolonged battle for Rimini, he was in Nov. transferred to Allied Land Forces, S.E. Asia (11th army group and U.S. forces in the India-Burma theatre). He was G.O.C.-in-C. Eastern Command, 1945-46. Succeeding to a baronetcy, 1937, he was made K.B.E., 1943. *See Accolade illus.*

Leet. Word of uncertain origin, meaning a court or assembly. In this sense it was used in England in the Middle Ages. In Scotland a leet is a selected list of candidates for an office. *See Court Leet; Manor.*

Leeuwarden. A town of the Netherlands. The capital of Friesland, it is 33 m. W. of Groningen, with which it is connected by rly. and canal. The chief church is Groote Kerk or Jacobynkerk, one of the largest in the country and formerly belonging to the Jacobins; several members of the Orange family were buried here, but their tombs have been destroyed. There is a palace in which the stadtholders of Friesland lived; a fine building, now housing the provincial library, was formerly the law courts. The old weigh-house and the town hall may be mentioned. The Frisian Society, which has its headquarters here, maintains a museum, and there are several libraries. The Oldehove is an unfinished church tower dating from 1529. Of the public grounds the chief is the prince's garden, laid out in 1648.

Leeuwarden has a trade in agricultural produce, fruit, and fish, and manufactures furniture, glass, linen, and gold and silver ware. Its cattle market is one of the most important in the country. Originally a port, it was a prosperous place in the 12th century, being then surrounded by walls. Gradually the sea receded, but the governors of Friesland, by making it their residence, assured a continuance of its prosperity. For many years the post of stadtholder was held by members of the Orange family. Units of the 1st Canadian army entered the town on April 15, 1945, the Germans having withdrawn. Pop. 74,438. *See Friesland; Frisians.*

Leeuwenhoek, Anton van (1632-1723). A Dutch naturalist. Born at Delft, Oct. 24, 1632, he took up for a hobby the making of lenses and the study of microscopic structures and forms of life. The excellence of his microscopes enabled him to describe in 1674 the red blood corpuscles

discovered by Swammerdam in 1658; also spermatozoa, infusoria, rotifers, etc. His researches laid the foundations of bacteriology, for he disproved the widely held idea of spontaneous generation of many small organisms; and revealed the microscopic structure of substances, e.g. hair, ivory. He died Aug. 27, 1723. His letters were published in Amsterdam in 1941.

Leeuwin. A cape of Australia. It is the extreme point of a peninsula of the same name, and the S.W. corner of the continent. Its name commemorates a ship Leeuwin (lioness) in the expedition of Dirk Hartog, Dutch explorer.

Leeward Islands. Group of the Lesser Antilles, which form a barrier between the Atlantic and the Caribbean Sea. They are so called as distinguished from the Windward Islands with reference to the trade winds. They lie in a curve, N. of the Windward Is.



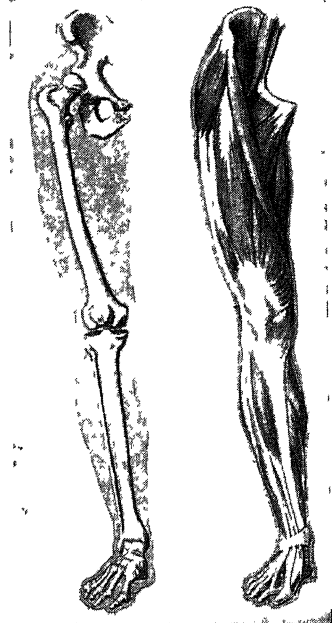
Leeward Islands
arms

and S.E. of Puerto Rico, and include four presidencies: Montserrat; the Virgin Is.; Antigua with Barbuda and Redonda; St. Kitts and Nevis with Anguilla and Sombbrero. Dominica was transferred to the Windward Is. for administration in 1940. Denmark sold her possessions in the Virgin Is. to the U.S.A. in 1917; the remainder are British, French, and Dutch. The total area of the British colony is 422 $\frac{1}{2}$ sq. m., and the pop. 108,847.

The islands are hilly and subject to hurricanes and earthquakes, but the climate is warm and healthy. The chief products are sugar, cotton, and sub-tropical fruits and vegetables. More than three-quarters of the people are negroes. The governor and executive council are nominated by the crown; the legislative council is partly nominated by the governor and partly elective. Each island has its own councils. Political franchise was introduced in St. Kitts, Nevis, Antigua, and Montserrat in 1936. The unit of currency is the pound sterling, but dollars also circulate in the Virgin Is. The main islands are noticed separately. *See map, p. 5054.*

Le Fanu, Joseph Sheridan (1814-73). An Irish novelist and journalist. Born in Dublin, Aug. 28, 1814, of an old Huguenot family, he was educated privately and at Trinity College, and in 1837 began to write for the Dublin

and inward towards the knee joint, of which its lower extremity is a part. As the female pelvis is wider



Leg. Diagrams of the human leg from front, showing, left, the bones; right, the principal muscles

than that of the male, the inward slant of the femur is more marked. Muscles of the thigh attached to the pelvis and to the bones of the lower part of the leg control the raising and lowering of the whole leg, the bending of the knee, and lateral movements, including a restricted lateral rotation. The long sartorius muscle, which twists diagonally round the front of the thigh from the outer and anterior crest of the pelvis to the inner rear portion of the tibia (*see illus.*) comes into play in the cross-legged attitude traditionally adopted by tailors, hence its name (*Lat. sartor, tailor*). The hamstrings at the rear of the knee are the tendons of the thigh muscle corresponding to the biceps of the upper arm.

There are two bones of the leg proper, tibia and fibula, running parallel and each joined to the other at knee and ankle. The sharp anterior edge of the tibia is partly subcutaneous, forming the shin. These bones receive in their upper parts the tendonous insertions of the thigh muscles, and give attachment to muscles which move the foot in any direction. The most easily recognizable is the gastrocnemius, which gives the calf its shape; its long, strong tendon stretching to the heel is known as the Achilles tendon

Main arteries of the leg are the femoral, anterior tibial, posterior tibial, and peroneal. *See Anatomy*; Ankle; Femur; Fibula; Hip; Knee; Muscle; Tibia.

Legacy (*Lat. legare, to bequeath*). In English law, a gift of personal property by will. Legacies are (1) specific: (2) demonstrative: (3) general. A specific legacy is of a particular, identified thing, *e.g.* my gold signet-ring. A demonstrative legacy is where the recipient is to have something out of a fund or other property; *e.g.* £50 out of the money I have in the savings bank. A general legacy is a simple gift of money; *e.g.* I give to A.B. the sum of £50. If the fund out of which a demonstrative legacy is to be paid has disappeared, the legacy becomes general, and must be satisfied out of the general estate. If there is not enough money to pay all general legacies in full, they are reduced proportionately to the value of the estate. *See Will*.

Legacy Duty. In the U.K., tax payable in the case of deaths prior to July 30, 1949, on all personal property (except leaseholds, or money from the sale of land, or money charged on land) acquired under a will or intestacy. It was first imposed in 1780 as a stamp duty on any receipt given to executors by legatees or next of kin. If no receipt was given no duty was payable. In 1796 it became a duty on the property received.

The rate of duty, like all forms of death duties, became higher with the passing of time. It depended on the relationship between the deceased and the person receiving the property.

Until 1910 it was not levied on the widow or widower of the deceased. At the time the duty was abolished in 1949 the rate was 2 p.c. for the widow, widower, children, or descendants or ancestors, 10 p.c. for brothers or sisters or their descendants, and 20 p.c. for more remote relations or strangers in blood, except for gifts for charitable purposes, where the rate was 10 p.c. There were many exemptions. When the duty was abolished sharp increases were made in the rates of estate duty on estates over £17,500 in order to compensate the revenue. *See Estate Duty*; *Succession Duty*.

Legal Aid. *See Poor Persons' Procedure*.

Legal Education. COUNCIL OF. Body appointed to superintend the education and examination of students for the bar in England.

Consisting of representatives of the four inns of court, five benchers being sent from each inn, it provides a number of readers who lecture on legal subjects, and arranges the examinations for admission to the bar. It was established in 1852, but is not a corporate body. Its offices are 15, Old Square, Lincoln's Inn, London, W.C. *See Barrister*.

Le Gallienne, RICHARD (1866–1947). British poet and author. Born at Liverpool, Jan. 20, 1866, and educated there, he became a literary critic and adviser to the publisher John Lane. A leader of the aesthetic movement of the 1890s, with



Richard Le Gallienne, British poet

Dowson, Symonds, and Yeats, he wrote a romantic novel, *The Quest of the Golden Girl*, 1896. Two years later he went to the U.S.A., but he later returned to France. He died at Mentone, Sept. 16, 1947. His publications include a study of Meredith (1890), many volumes of poems (*e.g.* *R. L. Stevenson and other Poems*, 1895), essays, and "prose fancies," as well as a reminiscent study of *The Romantic 90's* (1926).

His daughter, Eva Le Gallienne (b. 1899) became a distinguished figure on the American stage, especially in Ibsen and Chekhov. She was founder and director of the New York Civic Repertory Theatre.

Legal Memory. Term in English law. In order to prove the existence of a custom it is necessary to show that it has been in existence before the time of legal memory, *i.e.* from time immemorial. In 1276 this was fixed by statute as 1189 (accession of Richard I). This date still remains the test, but in practice the courts may assume that a later custom did exist before that date.

Legal Tender. In English law, the coinage in which debts may be paid, and which the creditor is bound to accept. These are (1) Bank of England notes to any amount for debts over £5; (2) gold to any amount; (3) silver or cupro-nickel up to 40s.; and (4) bronze coins up to 1s. During both Great Wars notes of Scottish banks were temporarily made legal tender in Scotland, while postal orders were legal tender in both countries. In the more distant parts of the British Empire the same principle prevails;

gold is legal tender to any amount, and silver and bronze up to a fixed figure. In Canada the gold coins of the U.S.A. are legal tender.

Legate (Lat. *legatus*, one legally deputed). An ambassador, and specifically one sent by the pope to a foreign power. Legates are of three kinds: (1) *a latere*, so called as being confidential persons at the pope's side, members of his council, deputed to represent the pontiff at councils, or sent as plenipotentiaries on missions of first importance; (2) *de latere* (or *missi*), entrusted with apostolical legation, and acting under special commission in matters of smaller importance; (3) *legati nati*, prelates who are legates in virtue of their office and not dispatched on missions. This use is obsolete. Legates are generally known as nuncios, or at minor courts internuncios. See Papacy.

Legation (Latin *legare*, to depute). Originally a person or persons sent out by the pope as legates. It then came to be used for those sent as envoys or ministers by secular rulers, and today is a collective term for the members of a mission sent to a foreign country. It is also used for the building in which these people live and work, unless the head of the mission is an ambassador. See Diplomacy; Embassy.

Legato (Ital., bound). Musical term, meaning smoothly. Consecutive notes of a phrase marked legato must not be detached, but each one must be held exactly until its successor is due. Legato is also indicated by a curved line over or under the notes, thus:



Legend (Lat. *legenda*, things to be read). Collection of lives of the saints, or other ecclesiastical narratives of a quasi-historical or traditional nature, especially the 13th century series known as The Golden Legend (*q.v.*); hence any similar single narrative. The name arose from the custom of reading these stories in convents at matins and meals. The name was soon extended to secular tales, as by Chaucer in The Legend of Good Women, and is now applied not only to pious and marvellous stories current among Christians, Jews, Mahomedans, Buddhists, etc., but to any fabulous story.

In numismatics, the legend is the inscription on a coin or medal.

Legend of Montrose, A. Story by Scott, published in 1819, and forming, with The Bride of Lammermoor, the third series of Tales of My Landlord. The book gives a vivid picture of a Highland feud in 1644, deals with Montrose's rivalry with the chief of the Campbells, and describes the battles of Tippermuir, Aberdeen, and Inverlochy. The love story of the earl of Monteith and Annot Lyle, the kidnapped daughter of Sir Duncan Campbell, and Dugald Dalgetty, are prominent features of the story.

Legendre, ADRIEN MARIE (1752-1833). A French mathematician. The place of his birth on Sept. 18, 1752, is variously ascribed to Paris and Toulouse. He attracted the attention of d'Alembert, and was professor of mathematics in the École Normale de Paris from 1783 until his death on Jan. 10, 1833. In 1785 he published his law of quadratic reciprocity and in 1794 his Elements of Geometry. His greatest mathematical works, however, were his *Traité des Fonctions Elliptiques*, on which he worked 40 years, and his *Théorie des Nombres*. A mathematician of the highest rank, Legendre's ability was not recognized during his lifetime, owing to his modesty and the jealousy of Laplace.

Legentilhomme, PAUL LOUIS (b. 1884). French soldier. Born at Valognes, March 26, 1884, he was educated at Le Havre and at St. Cyr, and was commissioned in 1907. In the First Great War he was captured on the western front, but escaped to join the French forces with Allenby in the Levant. In 1931 he quelled Communist riots in Annam. A brigadier and c.-in-c. in French Somaliland, at the outbreak of the Second Great War he commanded Allied forces there. Declaring

in 1940 for the Free French, he received no support and escaped from Jibuti to join Gen. de Gaulle. Then he raised a division in Palestine and led French forces in Syria, being in command of the Allied troops which took Damascus. In 1942 he became high commissioner for Madagascar. In the committee

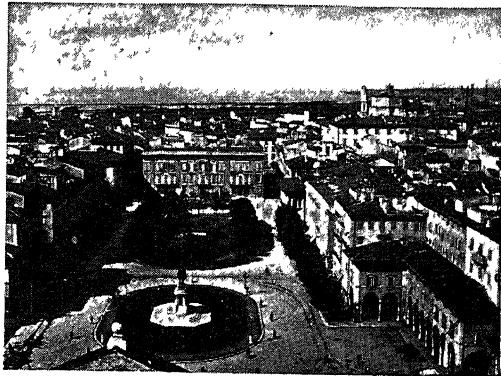
of national liberation, 1943, Legentilhomme was commissioner for national defence. After the defeat of Germany in 1945 he was made military governor of Paris.

Legge, JAMES (1815-97). A Scottish missionary and Chinese scholar. Born at Huntly, Aberdeenshire, he went out to Malacca in 1839, moving in 1842 to Hong Kong, where he worked for thirty years. In 1876 he was appointed to the newly founded chair of Chinese language and literature at Oxford. His greatest works are translations of the Chinese classics (7 vols.) and books on Confucius and Mencius. He also published in 1881 *The Religions of China*. He died Nov. 29, 1897.

Leghorn (Ital. *Livorno*). Province of Tuscany, N.W. Italy. It faces the Ligurian Sea, and is bounded on the N. and E. by the prov. of Pisa and S.E. by that of Grosseto. Its area, including the island of Elba and a few smaller islands, is 133 sq. m. Its products include iron, marble, coral, wine, oil, silk, hemp, fruits, and leather.

Leghorn. Seaport of Italy. The capital of the prov. of the same name, it is called by the Italians Livorno. It stands on a strip of land extending into the Ligurian Sea, 12 m. by rly. S.S.W. of Pisa. One of the trading ports of Italy, it has the only naval academy in the country. The port is guarded by a 16th century fort, and the harbour is from 10 to 26 ft. deep.

Its many industries include shipbuilding, glassmaking, metal founding, and the manufacture of silk and woollen goods, straw hats, paper, and soap. Exports are oil, marble, mercury, coral ornaments, hemp, wine, hides, preserved fruits, and silk. There are sulphur springs and fine sea bathing. The neighbouring marshes have been reclaimed. Pop. 135,359.



Leghorn, Italy. A general view showing Piazza Vittorio, taken before the Second Great War

First mentioned in 891, Leghorn remained a small town until 1550, when it was extended, fortified, and developed by the Medici princes. In 1741 it was severely damaged by an earthquake. There are fine open squares, adorned with statues of former kings. Among several lazarettos, that of San Leopoldo is one of the finest of its kind in Europe. During the Second Great War many fine public buildings suffered from Allied air raids. The city was taken by the U.S. 34th div., July 19, 1944, and before withdrawing the German occupying force wrecked the port installations and dock area. Among churches damaged beyond restoration was the cathedral, whose façade was designed by Inigo Jones. There were hits on the synagogue (1603); the church of S. Gregorio degli Armeni; several palaces, the civic museum, and theatres.

Leghorn Fowl. A hardy breed of domestic poultry which originated in Italy. The chief varieties are the brown and the white; others which may be considered fancy or show-birds are the black, buff, pile, duckwing, and cuckoo strains. The cock bird resembles the Dorking, but is smaller; it has a single upright comb, whereas that of the hen droops. The birds are good layers, but the eggs are smaller than those of the Dorking. They offer the advantage to the poultry-keeper that they are small eaters and require no undue attention. See Fowl, colour plate; Poultry.

Legion (Lat. *legere*, to collect). Chief unit of the Roman army. The original number of 3,000 infantry was increased in the time of Servius Tullius to 4,200, 3,000 heavy and 1,200 light-armed troops, and from the time of Marius onwards consisted of 6,000. The legion was divided into 30 maniples (*q.v.*) or companies, each of which was under the command of two centurions. The number of cavalry remained at about 300. In republican times four legions were recruited for each year, but in emergency the number was increased, as in the 2nd Punic War.

Each legion was under the command of six military tribunes before imperial times, when it had a permanent *legatus*, with under him about 60 centurions of various grades. The legionary soldier was equipped with a helmet, shield, cuirass, sword, dagger, and a missile weapon. As arranged by Augustus, each legion had a number and a name, the original

numbers being retained when new legions were recruited by later emperors: thus, there was a legio I Germanica, I Italica, I Parthica. Under the Empire the standing army consisted of 25 to 30 legions. Legion is now used colloquially for a large number. -See Rome.

Legion of Honour. A French order of merit. It was instituted by Napoleon I, then 1st consul, May



Legion of Honour.
Badge of the order

19, 1802. It was adopted by Louis XVIII, Charles X, Louis Philippe, the Second Republic, Napoleon III, and the Third Republic. Various changes were made, and the order now consists of five classes, grand cross, grand officer, commander, officer, and chevalier or knight. The president of the republic is the grand master, under whom there is a grand chancellor and a council. The badge is a five-branched cross with a medallion bearing a symbolical figure of the republic and round it the legend, République Française, 1870. This is crowned by a laurel wreath, and the ribbon is of red watered silk. When instituted it bore the figure of Napoleon surmounted by the imperial crown. Military members are entitled to pensions. Its chancellery is the palace of the legion of honour. It was awarded in the First and Second Great Wars to distinguished Allied commanders and certain towns.

Legion of Merit. U.S. naval and military decoration, instituted in 1939, for award to officers and men performing some outstanding service. This action need not be one of personal gallantry; the award may be for outstanding efficiency in administration. The decoration is made for the president by the war department.

The badge of the order consists of a five-limbed cross with double points, each point tipped with a golden ball, each limb enamelled white with red edges. The centre of the cross is a circular plaque of blue having thirteen white stars on it. The cross rests upon a green enamelled wreath, the intervening spaces between the limbs containing crossed arrows in gold. The star is suspended from a claret-coloured ribbon with white edges. There is only one class of the award to U.S. citizens, but for foreigners there are four classes

chief commander, commander, officer, and legionnaire.

Legislation (Lat. *legis*, of law; *latio*, proposing). In modern usage, the making of law. In most countries this is now done by an assembly, congress, or parliament, which has taken over in this matter the original powers of a sovereign or supreme ruler. Even in early times, however, the command of a sovereign was not usually supposed to be the expression of his personal will. The sovereign declared the law; he did not create it. Thus the source of declared law was thought to be ancient custom; and the relation between custom and law is still preserved in the British system. The common law still remains in the British system, in addition to the law produced by legislation. Further, the British constitution is not created by legislation; but in many countries a kind of legislation produces the constitution of the state on which normal legislation depends.

Normal legislation is of two kinds: primary, the making of statutes or acts or laws; and secondary, the making of by-laws or statutory rules. Primary legislation is the chief function of a parliament or assembly. In the British system the process is as follows: the executive or the cabinet presents a draft bill in parliament. The bill is "read" for the first time and then printed. The motion for a second reading is the occasion for a general discussion on the principles embodied in the bill, and if the majority vote in favour of a second reading the bill is then considered by a committee of the whole house, a standing committee, or a select committee. Amendments to the original draft are considered in committee, and the amended bill is then "reported" to the house. On this report stage there may be further amendment or a motion to block the passing of the bill altogether, but if the majority vote in favour of it the bill is read a third time. The bill is then taken to the other house, and when the two houses are agreed as to the amended bill, it is then given the "assent" of the king, and thereupon becomes an act or law. This procedure holds for the greater part of legislation, but occasionally a private member may introduce a bill. In practice, in the British system, only the bills introduced or accepted by the executive of the day ever become law.

Legislation in recent years in most civilized states has tended to

be chiefly (a) a consolidation of older laws, (b) industrial, economic or social, and (c) administrative or for the establishment of new organs of government.

Secondary legislation is of two kinds: (1) by-laws of subordinate legislative bodies and (2) rules and orders of the executive. The limits of the power of the former to make by-laws are laid down in the Act of Parliament constituting the subordinate legislative body, e.g. a local authority. The other form of secondary legislative is less well recognized. In recent years Acts tend to express general principles which, when the subject-matter is complex, need to be applied in detail; but parliament has no time for this, and therefore powers of applying the Act by rules and orders are conferred upon the minister of the department which is to provide administration under the Act. The actual drafting of orders, like the drafting of the statutes, is a task of the civil service, although the ministers are responsible to parliament. Such a system of delegated legislation has been much criticised, particularly by Lord Chief Justice Hewart, in his book, *The New Despotism*.

This process of legislation by orders increased greatly during the Second Great War until between 2,000 and 3,000 of such orders were made in each year. The Statutory Orders (Special Procedure) Act, 1945, introduced a new procedure for making orders.

It is usually supposed that legislation through a representative assembly is the laying down of rules for action among themselves of the people governed by those rules. Modern legislation is, therefore, one aspect of self-government. The older method of laying down rules for others is still practised in colonies ruled by ordinance, but the most important features of legislation are those which arise out of the will of the governed. Fantastic theories have been woven round the idea of self-government, since the authority making the law seemed in this case to be the same as the subject submitting to it. Obviously, however, the law so made cannot be a command at all. It is an agreement between equals as to the rules which shall govern their relationship, and it is probably based upon some general truth as to the nature of society which is commonly believed. *See* Law; Parliament; Sovereignty; State.

Bibliography. Legislative Methods and Forms, Sir C. P. Ilbert,

1901; Law and Public Opinion in England in the Nineteenth Century, A. V. Dicey, 1905; Laws of England, Halsbury, 1907-17; The New Despotism, Lord Hewart, 1929.

Legislative Assembly. In general any assembly that possesses powers of legislation, and therefore nearly every parliament. In a special sense it is applied to one of the assemblies of the French Revolution. On the dissolution of the national or constituent assembly in 1791, voting took place for a new representative body. This met on Oct. 1, consisted of 745 members, and was known as the legislative assembly. Its chief act was the declaration of war on Austria, but its authority was destroyed in Aug., 1792, by the threatened invasion of France and the consequent riots, which placed supreme power in the hands of the commune of Paris. The assembly sat a little longer, but before the end of 1792 was supplanted by the national convention (*q.v.*).

Legislature. Name given to the body in a country that has the power of making laws. In the U.K. it is, in theory, the king and the two houses of parliament; in practice, it is the houses of lords and commons, the latter having the preponderating power. In Canada and Australia it is the two houses of parliament, and in the U.S.A. the president and congress. Legislatures are sometimes divided into two kinds, sovereign and non-sovereign. The British is a sovereign legislature, because its powers are absolutely untrammelled; the French and American are not so, because there are certain things they must not do. *See* Government; Legislation; Parliament; State.

Legitim. In Scots law, portion of the movable property of a deceased person to which his or her children are entitled and of which they cannot be deprived by will. Legitim is one-third of the estate if there is a surviving spouse; half if there is not.

Legitimacy. A term used in English law. A person is legitimate who is born in lawful wedlock, or within such a period after a husband's death as to make it possible that the husband was the father of the child. Under the Roman law a child born illegitimate could be made legitimate by the subsequent marriage of the parents. This method of legitimization was accepted by the canon law and has been adopted by every European country except Russia. In Scotland it has long been permissible, but not until 1927 did it

apply in England and Wales. By the Legitimacy Act, 1926, a child is legitimated by the marriage of the parents, subject to the provisos (1) that nothing in the Act legitimates a person whose father or mother was married to a third person at the time when the illegitimate child was born: (2) that legitimation under the Act gives a person only such interest in real or personal property as is prescribed in the Act.

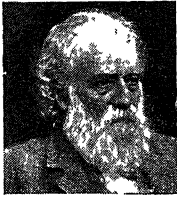
By the Judicature Act, 1925, re-enacting the Legitimacy Declaration Act, 1858, any person may take legal proceedings for a declaration that he is the legitimate child of his parents, or that his marriage, or that of his parents or grandparents, was valid. The proceedings are taken in the divorce court. *See also* Bastard; Illegitimacy.

Legitimists (Lat. *lex*, a law). Name given to those who believe that all authority has a divine sanction, and that the sovereign power in a state does not exist merely by the will of the people or the consent of the governed. In Great Britain the legitimists are those who believe that the execution of Charles I and the revolution of 1688 were national crimes, that the house of Stuart could not lawfully forfeit or be deprived of its divinely sanctioned authority, and that therefore the Hanoverian sovereigns were usurpers. British legitimists are known as Jacobites. The word is specially applied to those persons in France who, in 1830, protested against the accession of Louis Philippe as infringing the legitimate rights of the elder branch of the house of Bourbon. It was used in Spain for the Carlists, and in other countries for supporters of dynasties legally established. *See* Bourbon; Jacobites.

Legnago. A town of Italy, in Verona province. By rly. 29 m. E. of Mantua, it stands on the Adige. It is one of the Quadrilateral (*q.v.*) fortresses, its present defences dating from 1815. Trade is in cereals, rice, and sugar. Pop. 18,657. Legnago is not to be confounded with Legnano (*v.i.*). *Pron.* Len-yah-go.

Legnano. A town of Italy, in Milan province and 17 m. N.W. of that city by rly. It stands on the Olona, and has castle ruins, a 16th century church of S. Magnus, and textile industries. Here, on May 29, 1176, the Lombard League totally defeated Frederick Barbarossa in a battle which showed that pikemen could stand up to cavalry. Pop. 27,254. *Pron.* Len-yah-no.

Legros, ALPHONSE (1837-1911). Anglo-French artist. Born at Dijon, May 8, 1837, and apprenticed



Alphonse Legros,
French painter
Russell

to a house-painter, he went to Paris, worked under Cambon, the scene-painter, and studied at the Beaux Arts. Coming to England in 1863, he was appointed Slade professor

in London university in 1876, having previously been professor of etching at South Kensington. He rendered memorable service to art by insisting on simplicity in etching. Naturalized British in 1881, he resigned his chair in 1892, and died at Watford, Dec. 8, 1911. See Dalou, A. J.

Legume. A botanical term for one form of the fruit known as a pod. It is the characteristic fruit of peas, beans, and other plants of the Leguminosae (*q.v.*). See Fruit.

Legumin. Globulin-like protein found in the seeds of leguminous plants. It is called also vegetable casein owing to its resemblance to the casein of milk. To prepare it, finely powdered seeds—peas, beans, or lentils—are extracted with petroleum ether and the residue treated with salt solution. Ammonium sulphate is added to precipitate the legumin. The precipitate is then dissolved in salt solution and freed from chloride, whereupon the protein separates. The vegetable cheese made in China and Japan from soya bean, known as "tofu," consists largely of legumin. See Lecithin.

Leguminosae. An extensive family of herbs, shrubs, and trees, natives of all parts of the world. It is divided into three sub-families, which differ greatly in the forms of their flowers. In the great sub-family Papilionatae (the most familiar) the flowers are more like those of the pea; in Caesalpinioideae there are more regular flowers, and the species are almost all tropical; while in Mimosoideae the flowers are quite regular. All three divisions agree in having mostly compound leaves, and a pod of some kind. The roots, as a rule, bear tubercles produced by a bacterium which enables the plants to utilise the free nitrogen of the atmosphere. The edible seeds of a large number of species are known as pulse. Many valuable medicines and dyes come from Leguminosae, as well as timber and some poisons.

Leh. Town of Kashmir. Capital of the dist. of Ladakh, it is approached from the Kulu valley by road over the Baralacha Pass (16,500 ft.), stands on the Indus at an alt. of 11,500 ft., and is a caravan centre between India and Yarkand. It belonged formerly to Tibet. Pop. 4,000.

Lehár, FRANZ (1870-1948). Hungarian composer. Born at Komarom, April 30, 1870, he studied at Prague conservatoire, and conducted military bands in Budapest and Vienna. His first opera, *Der Kurassier*, was produced in 1894. His most famous work, *The Merry Widow* (*q.v.*), 1907, became one of the best-known operettas of modern times. In the Strauss tradition, with lifting waltzes, were *The Count of Luxembourg*, 1909; *Gipsy Love*, 1910; *The Blue Mazurka*, 1920. *The Land of Smiles* in 1931 brought Richard Tauber to fame in the U.K. Lehár died Oct. 24, 1948.

Lehigh. River of Pennsylvania, U.S.A. It rises in the state and flows mainly in a southerly direction before falling into the Delaware at Easton. Its length is 120 m., much of which is navigable. The railway line which runs through the river valley is named after it, and the valley is noted for its anthracite coal and iron. Lehigh university is at Bethlehem. Founded in 1865 by Asa Packer, it was intended to give the young men of the valley an education suitable to the needs of the district.

Lehman, HERBERT H. (b. 1878). A U.S. politician. Born in Williamstown, Mass., March 28, 1878, he was educated there, entered first the textile trade, and later joined the banking house of Lehman Bros. During the First Great War he reached the rank of colonel and was awarded the D.S.M. In 1932 he was elected governor of New York, and was chosen for each two-year term until he declined nomination in 1942. President Roosevelt then gave him charge of relief and rehabilitation overseas, and in 1943 he became director-general of U.N.R.R.A. Having defended his administration before a committee of the senate, Sept. 20, 1945, he retired in 1946 owing to ill health.

Lehmann, ELIZABETTA NINA MARY FREDERICKA (1862-1918). British singer and composer. Daughter of Rudolf Lehmann, the painter, she was born in London, July 11, 1862, and studied music in Germany. As Liza Lehmann she was a well-known soprano singer until 1894, when she retired

on her marriage to Herbert Bedford. She then devoted herself to composition, and in 1896 her song-cycle, *In a Persian Garden* (setting of Fitzgerald's translation of Omar Khayyam), was performed. Later song-cycles included *In Memoriam* (from Tennyson), *The Daisy-Chain*, and *Songs of Love and Spring*. Her stage setting of *Everyman* was produced in 1916. Professor at the Guildhall School of Music from 1914, she died Sept. 19, 1918.

Lehmann, LOTTE (b. 1888). German singer. Born at Perleberg, Feb. 27, 1888, she studied at the Berlin academy of music and, after establishing her reputation as an opera singer in Germany, appeared during successive seasons at Covent Garden and the Metropolitan, N.Y.C. Her fine dramatic soprano voice had great range and richness of tone in such parts as *Eva* in *The Mastersingers*, *Sieglinde* in *The Valkyries*, *Leonora* in *Fidelio*, and the princess in *Der Rosenkavalier*. Member of the Metropolitan Opera, she settled in the U.S.A. before the Second Great War.

Lehmann, RUDOLF CHAMBERS (1856-1929). British journalist. Born in Sheffield, Jan. 3, 1856, he went to Trinity College, Cambridge, was called to the bar, and was on the editorial staff of *Punch*, 1890-1919. He edited the *Daily News* in 1901, and represented Har-



R. C. Lehmann,
British writer

borough as Liberal M.P., 1906-10. A noted oarsman and rowing coach, he published *The Complete Oarsman* in 1908. His sister Liza Lehmann has a separate entry.

Of his three children, Beatrix (b. July 1, 1903) became an actress. Born at Bourne End, Bucks, she studied at the R.A.D.A., and made her début at the Lyric, Hammersmith, in 1924. With outstanding dramatic power and nervous intensity, she gave memorable performances in *Mourning Becomes Electra*, 1935; *They Walk Alone*, 1939; *Uncle Harry*, 1944.

Rosamond Nina, educated at Girton, Cambridge, made her name as a novelist with *Dusty Answer*,



Liza Lehmann,
British singer

1927. Later books included *A Note in Music*, 1930; *The Weather in the Streets*, 1936; *The Ballad and the Source*, 1944; *The Gipsy's Baby*, 1946.

John Frederick (b. June 2, 1907) became a publisher and writer after education at Eton and King's College, Cambridge. Editor and founder of *New Writing*, he encouraged young writers of diverse schools; founded his own publishing firm (originally the Hogarth Press); and wrote *Down River*, 1939.

Leibl, Wilhelm (1844–1900). German painter. Born at Cologne, Oct. 23, 1844, he studied under Ramberg and Piloty at Munich. His first picture, representing two fellow pupils looking at an engraving, was exhibited in 1869, and the following year a portrait gained the gold medal at the Paris Salon. Leibl's strongly realistic attitude to nature was chiefly inspired by Courbet, and like Millet he was drawn to peasant life. His picture, *In Church*, 1883, is a fine example of his manner. He died at Würzburg, Dec. 5, 1900.

Leibniz, Gottfried Wilhelm (1646–1716). German philosopher and mathematician. Born at Leipzig, July 1, 1646, in 1667 he was appointed councillor to the elector of Mainz, after whose death he became in 1676 aulic councillor and librarian to the duke of Brunswick-Lüneburg, and settled at Hanover. His versatility was shown in the invention of a calculating machine, and in working out a plan for a French invasion of Egypt, which Napoleon was to find he had largely followed. An elaborate history of the house of Brunswick, undertaken by Leibniz at the duke's request, remained unfinished.

Four years spent in Paris and two visits to England gained him the acquaintance of the leading men of science. He interested himself with Bossuet in an unsuccessful scheme for the reunion of the Catholic and Protestant churches. In 1700 he persuaded the king of Prussia to found the Berlin Academy, of which he was nominated perpetual president. He was much esteemed by Peter the Great, and Louis XIV tried to induce him to settle in France, but he died at Hanover, Nov. 14, 1716.

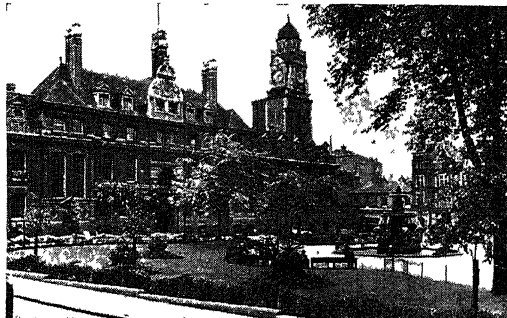
Leibniz was chiefly distinguished in mathematics and philosophy. While in Paris in 1672, on the invitation of the French government, he met Huygens, and was by him led to study geometry. The invention of the differential and integral calculus came in 1674, but it was not till 1677 that it was developed by him into a consistent system. It was not questioned at that time that he had invented the calculus independently of Newton, whose method of fluxions embodied the same idea with a different notation. Leibniz in 1704 published an anonymous review asserting that Newton had borrowed the idea of fluxions from him; this led to a long and bitter controversy.

In his philosophy, summed up in *La Monadologie*, 1714, he assumes the existence of monads, simple unextended substances endowed with power of action, which are the only real beings. All monads have ideas, of varying degrees of clearness. God is the original monad, and every soul is a monad. The actions and reactions of these monads are the result of pre-established harmony (*q.v.*). The principle of "sufficient reason" is the predominant idea of the system. Everything that exists has its reason, therefore everything is necessary. This world is the best possible. *Consult* *Lives*, J. Mackie, 1844; J. T. Merg, 1901; *Critical Study*, B. Russell, 1900. *Prom. Libe-nitz.*

Leicester. City, co. bor., and co. town of Leicestershire, England. It stands on the Soar, 25 m. S. of Nottingham and 99 m. N.W. of London. It has three railway stations (London Midland region of British Railways), and is also served by both the Grand Union and the Navigation canals.

Leicester possesses several old churches. The oldest are S. Nicholas, dating from Saxon times, S. Mary's and All Saints, dating from Norman times, although much restored. S. Martin's and S. Margaret's are E.E. and Perp. in style. Specimens of Roman pave-

ments and other Roman relics have been unearthed, and are preserved by the corporation. There is a timber and plaster guild hall,



Leicester. Town Hall of this important industrial city and midland county town

originally the hall of the Corpus Christi guild, used as a town hall from 1563 to 1876. Trinity Hospital is an old foundation endowed by Henry, earl of Lancaster. Of the castle, long the residence of the earls of Leicester, there are only a few remains, including the great hall, now used as assize courts, and the gateways. There are a few ruins of the abbey of S. Mary, in which Wolsey died. Modern buildings include the municipal buildings, De Montfort Hall, corn exchange, art gallery, and museum. The university college was founded 1921. Vaughan College provides adult education. The chief papers are *The Leicester Mercury* and *The Leicester Mail*.

The manufacture of boots and shoes and hosiery, with ancillary trades, were the staple industries until the needs of war accelerated the development of engineering, which is now Leicester's major industry. The city is a centre of good printing. Its geographical position, providing exceptional facilities for retail distribution, has made it a headquarters for multiple shoe stores.

Leicester owes its foundation to the Romans, who in A.D. 50 established a camp (*Ratae Coritanorum*) on the banks of the Soar. In Anglo-Saxon times it was a considerable town, having its own bishop from 680 to 874. The bishopric was then transferred to Dorchester, Oxon. On its surrender to the Danes, Leicester became a member of the confederation called the five boroughs. Soon after the Norman Conquest it had a merchant guild. It was allowed a market and several annual fairs, and its prosperity was largely due to the wool industry, introduced before the 13th century. A



Gottfried Leibniz, German philosopher and mathematician



Leicester arms

priory for Augustinian friars was founded here in the 12th century. In 1888 it was made a county borough; in 1919 it received back its ancient title of city. It sends four members to parliament. In 1935 the boundaries of the borough were enlarged. In 1926 Leicester became the headquarters of a new diocese, with S. Martin's for the cathedral. Market days, Wed. and Sat. Pop. est. 275,080.

Leicester, EARL OF. English title borne by various families, at present by that of Coke. The Beaumonts, a Norman family, were the first earls; in 1206, after their extinction, the earldom was given to Simon de Montfort. His son, also earl of Leicester, was the famous founder of the House of Commons. Edmund, earl of Lancaster, a son of Henry III, obtained the earldom after Earl Simon's death in 1265, and it was held by that family when Henry IV, duke of Lancaster, became king in 1399.

This earldom, therefore, was a secondary title until 1564, when Elizabeth made Robert Dudley, her favourite, earl of Leicester. It became extinct on his death in 1588. The next earl was Robert Sidney, a brother of Sir Philip, created in 1618; and there were seven Sidney earls, the last dying childless in 1743. Thomas Coke, Lord Lovel, was earl of Leicester from 1744-59, and George Townshend and his son from 1784 to 1855. Meanwhile, in 1837, another earl of Leicester had come into existence. Thomas William Coke was given the title once held by a kinsman, Thomas Coke, but he was described in the patent as Leicester of Holkham. His son and namesake (1822-1909) was a figure in the society of his day. The title is still held by the Cokes, the estates of the earl being in Norfolk, where is his seat, Holkham Hall (*q.v.*). His eldest son is called Viscount Coke. Coke is pronounced Cook.

Leicester, ROBERT DUDLEY, EARL OF (c. 1532-88). English courtier. Fifth son of John Dudley, duke of Northumberland, executed for his support of Lady Jane Grey (*q.v.*), he narrowly escaped the scaffold himself on the same charge. Knighted by Edward VI, he in 1550 married Amy Robsart (*q.v.*), to whose death at Cumnor, in 1560, he was supposed to be an accessory. For some 30 years a favourite of Elizabeth, and on that account her most powerful subject, he was also for many years her suitor. He was M.P. for Norfolk, 1553; master of ordnance at the siege of St. Quentin, 1557; and high steward of Cambridge University, 1562. Created Baron Denbigh and earl

of Leicester, and appointed chancellor of Oxford University, 1564, he in 1573 secretly married Lady Sheffield, by whom he left a son.

He entertained Elizabeth with great pomp at Kenilworth, in 1575; and in 1578 bigamously married Lettice Knollys, countess of Essex (d. 1634). In 1585 he commanded the expedition to the Low Countries in which his nephew, Sir Philip Sidney (*q.v.*), met his death; he accepted the governorship of the United Provinces in 1586; was recalled in 1587; was appointed in 1588 to command the forces at Tilbury; and died suddenly at Cornbury, Oxfordshire, it is supposed, of poison intended for his wife, Sept. 4, 1588.



Robert Dudley, Earl of Leicester

An accomplished courtier, and of gracious presence, he was an inefficient statesman and an indifferent soldier. Unprincipled and unscrupulous in the pursuit of his own ends, he took some interest in literature and the drama. Considerable controversy has taken place in regard to the various crimes of which he has been accused. See *Leicester's Commonwealth*, attributed to the Jesuit Parsons, ed. F. J. Burgoyne, 1904; and Scott's novel, *Kenilworth*.

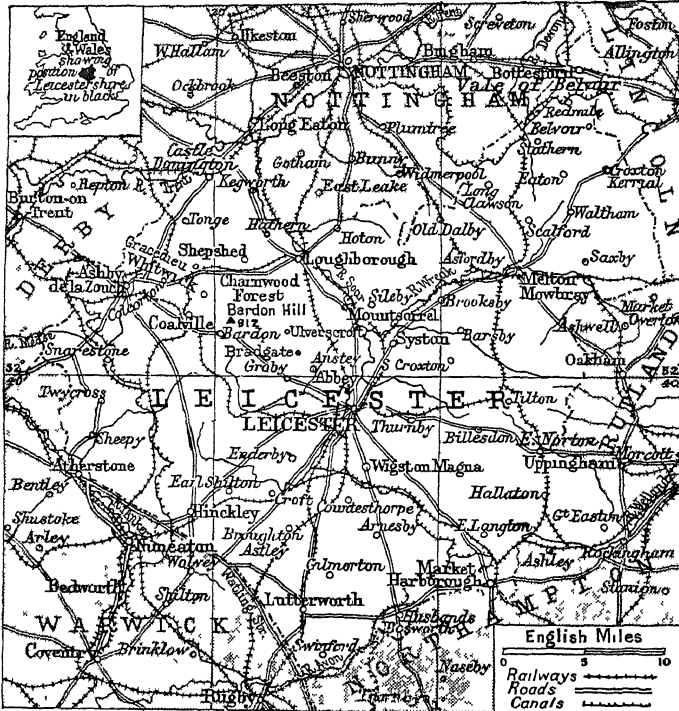
Leicester, THOMAS WILLIAM COKE, EARL OF (1754-1842). British nobleman and agriculturist, known as Coke of Norfolk. He was the son of Robert Wenman, who took the name of Coke as the heir to his uncle, Thomas Coke, earl of Leicester. Born May 6, 1754, he inherited, in 1776, the estates which in the previous year had come to his father, including Holkham Hall and much land in that part of Norfolk. In the same year he entered Parliament as M.P. for the county, and except for a few years he was there until 1833. In 1837 he was made earl of

Leicester of Holkham, and he died June 30, 1842, being succeeded by his son, Thomas William. Coke won lasting fame as an agriculturist by the improvements he effected on his estates. His experiments and perseverance led to a much greater output of crops and to a marked improvement in the breed of cattle and sheep. He was also a prominent Whig and one of the most remarkable figures of his day. See *Agriculture*; consult also Coke of Norfolk and his Friends, A. M. W. Stirling, new ed. 1912.

Leicestershire. A county of England. In the Midlands, its area is 832½ sq. m. The county is fairly level, the most elevated area being Charnwood Forest, whereon Bardonia Hill rises to over 900 ft. In the N.E. are the wolds. The chief river is the Soar, which with the Anker, Devon, Mease, and other streams flows to the Trent. The Avon and the Welland are boundary rivers. Leicester is the county town; Loughborough is the only other borough, although there are a number of populous market towns and urban districts, e.g. Hinckley, Melton Mowbray, Market Harborough, and Shepshed. The main industry, outside the hosiery of the towns and a certain amount of mining around Coalville in the N.W., is farming. The soil is good, and there are many rich dairy farms. Cattle and sheep are reared and wheat, oats, and other cereals grown. The co. is one of the shires and Melton Mowbray the centre of the foxhunting area.

Before the Norman Conquest Leicestershire was part of Mercia and of the district ruled by the Danes. The antiquarian remains are not numerous, although there were several religious houses in the county, one being at Gracedieu and another at Ulverscroft in Charnwood. Since 1918 the county has sent four members to parliament, the county constituencies being Bosworth, Harborough, Loughborough, and Melton. In addition Leicester sends four. Pop. 541,861.

LITERARY ASSOCIATIONS. At Leicester Abbey Cardinal Wolsey died, and an old house in the city is shown as one wherein both Bunyan and Wesley stayed. At Leicester was born Thomas Cooper, the Chartist poet. Francis Beaumont was born at Gracedieu. Bradgate, in Charnwood Forest, is associated with Lady Jane Grey and Roger Ascham. At Market Bosworth Grammar School Samuel Johnson taught for a time. Ashby-de-la-Zouch is the scene of several incidents, including the tournament in



Leicestershire. Map of this midland county of England, mainly agricultural

Scott's *Ivanhoe*. Lutterworth is known for its associations with Wycliffe, rector here for ten years. The *Victoria History of the co.* appeared in 1907.

Leicestershire Regiment, ROYAL. Regiment of the British army, formerly the 17th Foot. It was raised by James II in 1688 and fought in Flanders for William III and Anne, winning its first honour at Namur, 1695. At the battle of Al-



Leicestershire Regiment badge

manza, 1707, the regiment lost heavily. It shared in the capture of Louisburg, 1758, and Montreal, 1760, and fought through the American War of Independence. In 1804 the Leicestershires went to India, where their services were rewarded by a grant of the badge of the royal tiger and the word *Hindoostan*. In 1839 they served in Afghanistan, leading the assault on the fortress of Ghazni. Later campaigns include the Crimean War, the second Afghan War, 1878-79, and one in Burma. The Leicestershires, in South Africa when the war broke out in 1899, helped to defend Ladysmith.

Nine battalions of the "Tigers" were raised for service in the First

Great War and gained the honours *Aisne*, 1914; *Neuve Chapelle*; *Somme*, 1916, '18; *Ypres*, 1917; *Cambrai*, 1917, '18; *Lys*; *St. Quentin Canal*; *France and Flanders*, 1914, '18; *Palestine*, 1918; *Mesopotamia*, 1915-18. In the Second Great War battalions fought in Norway, France, N. Africa, Crete, Syria, Italy, Greece, Burma, Belgium, the Netherlands, and Germany. A battalion was with the Chindit force and a second became an airborne unit for Wingate's invasion of Burma. In 1946 the regiment was given the prefix *Royal*. The depot is at Leicester.

Leicester Square. An area in London between Charing Cross and Piccadilly. Cranbourn Street runs into its N.E. corner, New Coventry Street is N.W., Irving Street S.E., and Panton Street S.W. Built in 1635-71, it was named after Robert Sidney, earl of Leicester, whose mansion, Leicester House, stood with Savile House on the N. side. At Leicester House, pulled down on the formation of Lisle Street in 1790, Elizabeth of Bohemia, and Frederick, son of George II, died, and George II when prince of Wales held a petty court. By the proceeds of its sale the Sidneys freed their historic home at Penshurst from financial encumbrances.

At Savile House, raided by the Gordon rioters, 1780, and burnt down 1865, George III spent his boyhood, and Peter the Great was entertained by the marquess of Carmarthen. At a house at the S.E. corner, later Archbishop Tenison's school, Hogarth died, and Kosciusko and the Countess Guiccioli resided; and next door, John Hunter, the surgeon, began his museum. At No. 47, on the W. side, Reynolds lived 1761-92; in the adjoining St. Martin's Street, Newton, John Opie, and Thomas Holcroft lived, and Fanny Burney wrote *Evelina*.

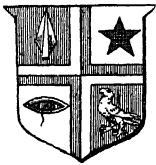
Leicester Square, which became a place for duels, also numbered Speaker Onslow, Swift, and Mrs. Inchbald among its inhabitants. After falling into decay, the central garden was bought by Baron Albert Grant, who had it laid out under the direction of Sir James Knowles, erected a statue of Shakespeare by Fontana, together with busts of Reynolds, Newton, Hogarth, and Hunter by other sculptors, and presented it to the nation in 1874. The principal buildings round the square are cinemas into which the former Empire, Alhambra, and Daly's Theatre were converted. Here too are the Royal Dental hospital and the building of the Automobile Association. Archbishop Tenison's school was damaged and Thurston's billiards hall destroyed in air attacks of the Second Great War, of which the worst were in Oct., 1940, and April, 1941.

Leichhardt, FRIEDRICH WILHELM LUDWIG (1813-48). German explorer. He was born at Trebatsch, Brandenburg, Oct. 23, 1813. He went in 1841 to Australia and began geological surveys and investigations, the results of which were published in *Contributions to the Geology of Australia*, 1855. In 1844 he made another journey of discovery in Australia, and travelled from Moreton Bay through Queensland to Port Essington in the far north of the continent. Returning to Sydney, he published the results in his *Journal of an Overland Expedition in Australia*, 1847. He set out again in 1848 with the object of travelling across Australia from east to west, but the last heard of him was from Macpherson's station on the Cogoon river, April 3. Five relief expeditions were dispatched between 1861 and 1865, but no trace of Leichhardt has ever been discovered.

Leiden. Town of the Netherlands also spelt *Leyden* (*q.v.*).

Leidy, JOSEPH (1823-1891). A U.S. scientist. Born at Philadelphia, Sept. 9, 1823, he graduated at its university and in 1847 became chairman of the board of curators at its academy of natural sciences. This position he held until his death, April 30, 1891. In 1853 he was made professor of anatomy, and in 1884 director of the biological department. His *Treatise on Human Anatomy*, 1861, enlarged 1889, was long the standard American text-book on the subject. Leidy also devoted time to microscopical study of the lower forms of life, and was an authority on vertebrate palaeontology, publishing *Cretaceous Reptiles of the United States* (1865), *Extinct Mammalian Fauna* (1869), etc. His works were illustrated by his own drawings.

Leigh. A mun. bor. and industrial town of Lancashire, England. It is 7 m. S.E. of Wigan and 11 m.



Leigh arms

W. of Manchester and is served by branch railway line and also by canals. There is a regular bus service to Manchester. The principal building is the parish church of S. Mary the Virgin, a fine Perpendicular edifice with a rebuilt tower. Industries are cotton manufacture, coalmining, and electrical and general engineering. Incorporated in 1899, the borough has a town hall, technical college, and public library. Leigh gives its name to a borough constituency, which also includes Atherton and Tyldesley. Market days, Wed., Fri., Sat. Pop. est. 46,450.

There are many other places of this name in England, e.g. a village in Staffordshire, 4 m. N.W. of Uttoxeter, with a railway station and a pop. of 754; a hamlet in Kent, 2 m. W. of Tonbridge; and places near Reigate, Surrey; Worcester; and Kingsbridge, Devon. Leigh-on-Sea is part of Southend-on-Sea (q.v.).

Leigh, VIVIEN. Stage name of the British actress who became Lady Olivier (b. 1913). Vivian Mary Hartley was born Nov. 5, 1913, at Darjeeling, was educated at the Convent of the Sacred Heart, Roehampton, and studied at the R.A.D.A. She made her first success on the stage in *The Mask of Virtue*, at the Ambassadors' Theatre, 1935; was much praised in a revival of *The Doctor's Dilemma*, 1942; and gave brilliant satirical impressions

in *The Skin of Our Teeth*, 1945, and a *tour de force* of emotional acting in *A Streetcar Named Desire*, 1949. Her chief films were *Gone with the Wind*; *Lady Hamilton*; *Caesar and Cleopatra*. In 1940 she married (Sir) Laurence Olivier.

Leigh Light. Airborne searchlight developed by the R.A.F. in the Second Great War for detecting enemy submarines which had surfaced during the night to recharge their batteries. The light was mounted in a nacelle below the aircraft wing and powered by a dynamo driven by the aircraft engine; it threw a cone-shaped beam of 5,000,000 candle power. Designed and developed by Wg.-Cdr. H. de V. Leigh, the light was adopted by Coastal Command in 1943, special squadrons being formed for its operation. It proved one of the most potent anti-submarine weapons.

Leigh-Mallory, SIR TRAFFORD LEIGH (1892-1944). British air officer. Born at Mobberley, Cheshire, July 11, 1892, he was the son of the rector, and younger brother of George Leigh Mallory, lost on Everest in 1924. After education at Haileybury and Magdalene, Cambridge, he joined the Royal Flying Corps in 1916. Senior air staff officer in Iraq, 1936-37, he next commanded operational groups of Fighter Command, and in 1942 became A.O.C.-in-C. of the whole command. When Gen. Eisenhower formed in 1943 his staff for the invasion of Europe, Leigh-Mallory was placed at the head of the Allied Expeditionary Air Force and promoted air chief marshal; this command included all save the long-range strategic bombers and coastal aircraft. In Oct., 1944, he was appointed to command the air forces in S.E. Asia, but the aircraft taking him out on Nov. 14 crashed near Grenoble, and he was killed.

Leigh-on-Sea. This Essex seaside resort is part of Southend-on-Sea (q.v.).

Leighton, FREDERICK LEIGHTON, BARON (1830-96). British painter and sculptor. Born in Scarborough, the son of a successful physician, Dec. 3, 1830, he was taken abroad before he was ten, and was educated in Rome, Frankfurt, Florence, and other

places. He showed great artistic skill at an early age, acquired a sound knowledge of the stories of classical literature, and became an expert linguist.

Leighton's serious art education was received in Brussels and Paris, and in the latter place he produced his first picture, *Cimabue and Giotto*. At 20 he left Paris and returned to Frankfurt for three years, and thereafter to Rome. Here he completed his picture of *Cimabue's Procession*, exhibited at the R.A. in 1855, and bought by Queen Victoria. In 1858 he was back in London, and quickly achieved high repute. He became A.R.A. in 1864 and shortly afterwards R.A., and began the erection of his house in Holland Park Road, London. Its notable feature, the Arab Hall, had its origin in his visit in 1868 to Egypt, where he collected a number of Persian and Arab tiles. He became P.R.A. in 1878, and was knighted. A baronetcy followed in 1886, and in 1896 he was made a baron. He died, however, on the following day, Jan. 25, 1896. He had never married, and the title became extinct.

Leighton exhibited year after year at the R.A. a fine series of canvases, most of them connected with classical story. In the representation of drapery and in the rhythm of line his only contemporary rival was Albert Moore. He was also a capable sculptor. In his pictures the figures have all the quality which belongs to sculpture. Though neither an inspired draughtsman nor a great painter, he revealed a Greek love for beauty of line and form. His preparatory sketches for his paintings are notable for their exquisite rhythm and skill. He himself was a man of grace and refinement. Leighton's *Discourses*, published in 1897, deal with the development of western art. He is particularly well represented in the Manchester art gallery, and his *Return of Persephone* (Leeds) and *Bath of Psyche* (Tate) are famous. He designed some striking black-and-white illustrations for Dalziel's Bible. See *Andromachē* illus.; Colour-printing plate.

Bibliography. Lives, E. Rhys, 1900; G. C. Williamson, 1902; *The Life, Letters and Work of F. L., E. I. Barrington*, 1906.



Lord Leighton,
British artist
Ellott & Fry



Sir T. Leigh-Mallory,
British air officer

Leighton, ROBERT (1611-84). Scottish divine. He is said to have been born in London, was educated



Robert Leighton,
Scottish divine

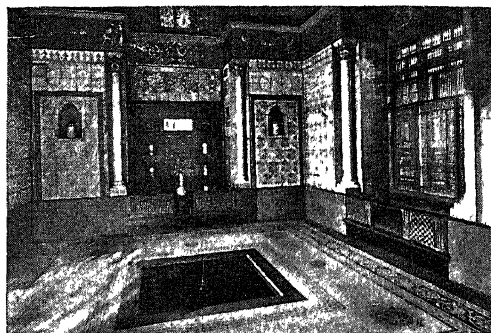
at Edinburgh and Douai, became a Presbyterian minister at Newbattle, and in 1653 principal of the university of Edinburgh and professor of divinity. On the revival of episcopacy in Scotland, he was consecrated bishop of Dunblane in 1661, and translated to the archbishopric of Glasgow eight years later. In 1674 he resigned and spent his remaining years in retirement at Horsted Keynes, in Sussex. He died June 25, 1684. A man of saintly life, he strove to reconcile the religious factions of his country. His works, not published till after his death, included aphorisms that influenced Coleridge. *Consult Works*, with Life, by J. N. Pearson, 1830; Life, E. A. Knox, 1930.

Leighton Buzzard. Urban dist. and market town of Bedfordshire, England. It stands on the Ouzel, 7 m. W.N.W. of Dunstable. There is a railway junction here. Near the Grand Union Canal, the town has a trade in corn, timber, sand, concrete, tiles, clothing, and ironmongery. The chief building is the church of All Saints, restored in the 19th cent. Others are the town hall, corn exchange, and almshouses. The splendid market cross, restored 1852, stands in the market square. The town takes its name from the family of Beaudesert or Bosart, long resident here. Market day, Tues. Pop. 7,031.



Leighton Buzzard, Bedfordshire.
The Market Cross, restored in 1852
From a drawing by C. G. Harper

Leighton House. London residence during 1866-96 of Frederick, Lord Leighton (*q.v.*). It is in Holland Park Road, Kensington, W., was designed by G. Aitchison, and after Leighton's death was given to the nation by his sisters. Oriental in character and decoration, its chief feature is the Arab hall, completed in 1879. Approached from the inner hall by a corridor lined with blue tiles, enclosing plaques from Damascus, it is decorated with Saracenic and Persian tiles of 14th and 16th century workmanship, and has Damascus work in the gallery and the lattices of the lower windows. Above the small fountain in the centre of the hall is a dome set with fragments of red, blue, and orange glass from the Orient. The house, to which is attached an old-world garden, contains examples of Leighton's own work. It was badly damaged by bombs in the Second Great War.



Leighton House, London. Interior of the Arab Hall, decorated with ancient Saracenic and Persian tiles

Leine. River of Germany. A tributary to the Aller, it rises in Thuringia, S. of the Harz Mts., flows W. for a short distance, then turns sharply to flow N. past Göttingen and Hanover. The valley forms an important line of communication from Hanover to the hilly country of S. Germany.

Leinster. One of the four provinces of Eire. In the E. and S.E. of the country, it contains 12 counties — Carlow, Dublin, Kildare, Kilkenny, Laoighis, Longford, Louth, Meath, Offaly, Westmeath, Wexford, Wicklow—also Dublin co. bor. It has a long coastline on the Irish Sea, while the Shannon divides it from Connacht. Its area is 7,580 sq. m., and its pop. 1,259,790.

Leinster, the land of the broad pointed spears, was one of the Irish kingdoms, having its own rulers until the time of Henry II. By marriage with the last king's daughter, Strongbow secured the territory, which passed to his son-in-law, William Marshal, earl of Pembroke. It was soon divided into five liberties, Carlow, Kil

kenny, Wexford, Kildare, and Leix, and later into counties. It includes the old kingdom of Meath. *See Eire*; Ireland.

Leinster. Mountain of Eire. The highest point of the Blackstairs range, it is on the borders of cos. Carlow and Wexford. Its altitude is 2,610 ft.

Leinster Regiment. Former unit of the British army. The first battalion was raised in 1857 from Canadians who had volunteered for service in the Crimean War; it was called the Prince of Wales's Royal Canadians and given the number

of a disbanded regiment, the 100th Foot. In 1881 the 100th was amalgamated with the 109th Foot, which had been re-formed in Poona in 1853 as the 3rd Bombay European Infantry. Following amalgamation, the 100th and 109th were retitled the Leinster Regiment, and saw service together in the S. African War. During the First Great War, the regiment raised seven battalions and fought in France, Flanders, Macedonia, Gallipoli, and Palestine. On the establishment of the Irish Free State in 1922 it was disbanded.

Leintwardine. Village of Herefordshire, England. At the junction of the Teme and Clun, 6 m. W. of Ludlow, and the site of the Roman Bravinium, it is visited by anglers and archaeologists. It has a stone bridge, and a partly Norman but mostly Plantagenet church, where is buried General Tarleton (1754-1833), the cavalry leader against the Americans in the War of Independence.

Leipzig. Largest city of Saxony, E. Germany, formerly capital of the Saxon province of the same name. It has an area of 50 sq. m and is situated on the small rivers Elster, Pleisse, and Parthe. One of Germany's earliest rly. centres, and until it was wrecked in the



Leinster arms

Second Great War, one of the most important, it boasted Europe's largest and most impressive railway station; it held one of the oldest as well as the greatest regular trade fairs of the world; was for long Europe's fur trading centre; and was Germany's, possibly Europe's, greatest emporium of book production and trading. Its great musical tradition goes back to J. S. Bach; and its university was one of the oldest (1409) and greatest of Germany, with some 400 teachers and well over 8,000 students, a library of 6,000 manuscripts, 800,000 bound, 350,000 stitched books, and many subsidiary institutions. Leipzig also held Germany's highest courts, the Reichsgericht, with several other supreme legal bodies.

Historic Landmarks

The site of Leipzig's medieval fortifications was occupied by an impressive ring of parks and gardens, of which the Rosenthal, with a zoo, and Johanna park, with adjoining woods and a palm garden and racecourse, were the most popular. The interior of the city, despite modernisation, retained traces of Leipzig's great medieval period: e.g. the Pauline church (13th cent.), S. Matthew's (1494-1504), S. Nicholas's, of unknown, very great age, reconstructed 1785-96, the old stock exchange (1678-87), the Gohlis little palace (1750), the house where Schiller lived in 1785, a Renaissance town hall dating back to the 1550s, and a number of patrician dwellings of the Baroque period. A huge massive building commemorates the site, on the outskirts of the city, of the battle in 1813 in which Napoleon was defeated by the Allies. The large modern halls which housed the twice yearly fair, with their 8,000-10,000 exhibitors, 140,000-200,000 buyers, up to 20 p.c. of each from abroad, were destroyed by Allied bombing from the air in the Second Great War. The university, mostly modern, the publishers' exchange and archives, the buildings of the great industrial combines established at Leipzig because of its vicinity to the lignite fields—engineering and electrical works, machine tool, motor car, textile,

musical instrument, toy, chocolate, etc., factories—were impressive. Excellent theatres, concert halls, museums, schools, etc., completed a prosperous, highly progressive community. Pop. (1939) 701,606.

An old Slavonic settlement, Leipzig's name appears in records first in 1015. It became a city c. 1160 and began to hold fairs of importance in 1268. Professors from Prague established the university in 1409. A seat of the Reformation, proclaimed there by Luther in his disputation of 1519, it is connected with the names of Gottsched, Gellert, Goethe, etc.; while Leipzig's musical figures include Bach, Mendelssohn, and Schumann.

The town suffered heavily during the Thirty Years' War, but soon recovered, taking the place of Frankfurt-on-Main as Germany's publishing centre. It suffered again during the Seven Years' War and Napoleon's invasion, then became famous as the battlefield on which, Oct. 16-18, 1813, his empire collapsed, long before his final defeat. The first inter-state railway in Germany, between Magdeburg and Leipzig, was opened in 1840; and in 1879, in recognition of the city's part in creating German unity, the former supreme commercial court of the N. German federation at Leipzig was transformed into the Reich's supreme court of appeal.

In the Second Great War

Untouched by the First Great War, Leipzig was badly damaged in the Second. Attacked several times by the R.A.F. in the summer of 1940, it was not hit again until, on Oct. 20, 1943, the R.A.F. made the first of a series of severe Allied raids ending with a double attack on April 10, 1945. Spearheads of the U.S. 1st army reached the outskirts of the city on April 17, launched an attack from E. and W. next day, and

gained control of it during the night of April 19-20; the monument to Napoleon's defeat was defended fanatically by S.S. troops who surrendered only when heavy artillery fired at point-blank range. The mayor, his wife and daughter, and the city treasurer, his wife and daughter, were found dead of self-poisoning in the town hall.

Leipzig came into the Russian zone of occupation. The Soviet authorities dismantled and removed nearly all important industrial equipment, including printing plant. The fur trade, with its 500 shops for the most part in Jewish hands, had vanished to London, New York, and elsewhere in the early days of the Nazi regime. The fair was restarted under the Russian aegis in 1946, with small success owing to lack of goods and restrictions on travel from abroad.

Edgar Stern-Rubarth

Leipzig, BATTLE OF. Fought between Napoleon and the allies, Oct. 16-18, 1813, and known as the battle of the nations. After the retreat from Moscow, Napoleon by strict conscription had raised a new army, but of much inferior personnel to the old. He still had the Saxons, but was opposed by Russians, Austrians, Prussians, and Swedes. Blücher commanded 95,000 combined Russians and Prussians from the direction of Breslau, while Schwarzenberg had nearly 200,000 Austrians and Russians in Bohemia, and Bernadotte against him 135,000 Swedes.

Napoleon, after Dresden, had decided to defend the line of the Elbe with 300,000 men, and remained himself in Dresden, but Schwarzenberg, reinforced, made a rapid march to the Elbe through Bohemia under cover of the mountains, and Napoleon fell back rapidly on Leipzig, menaced by Schwarzenberg from the S., Blücher from the N.E., and Bernadotte from the N. On Oct. 15 Napoleon had concentrated about 150,000 men to the E. of Leipzig, with a weak detachment to the W. On the 16th Schwarzenberg had brought 180,000 men into action, and he was reinforced by 60,000 fresh men on the following day. Blücher was attacking with some 60,000 men, and Bernadotte was expected on the 18th. Napoleon moved the bulk of his troops S.E. of the town to attack Schwarzenberg, leaving a containing force to hold Blücher. Through obstinate fighting the French held firm, and the only success to the allies was that Blücher had taken the village



Leipzig, Germany. Pre-war view of the railway station at that time the largest in Europe



Leiria, Portugal. General view of the town, with the castle transformed into a palace by King Diniz, 1229-35

of Möckern, bringing him within a mile of the town.

Oct. 17 was spent in indecisive skirmishing, but Schwarzenberg's reinforcements had come up, the Swedes were close at hand, and by noon on the 18th Bernadotte had closed the gap N.E. of the town. Still Napoleon held the Austrians, his line to France was open, and the battle was not lost; but at 2 p.m. there was a startling turn of fortune, the Saxons yielding up their portion of the position and going over to the allies. The French had still their open gap, and, fighting desperately, made good a costly retreat. By day-break on the 19th a poor half of Napoleon's army escaped by the Erfurt road. The Bavarians tried to stop the retreat, but Napoleon managed to bring back part of his army to France: of the 80,000 men who perished on the field of battle, more than half were French. Consult The Leipzig Campaign, F. N. Maude, 1908.

Leipziger Neueste Nachrichten. Chief pre-Nazi daily newspaper in central Germany, with over 200,000 subscribers. Founded in 1892 by the publisher Herfurth and the writer Liman (brother of the later marshal Liman von Sanders), it was moderately nationalist, and was abolished by the Nazis in 1937.

Leipzig Fair. German annual institution. The chief gathering, the Easter fair, was founded, like that at Michaelmas, about 1170, a New Year fair being added in 1458. Fostered by the margraves and electors of Saxony, and important from the 16th to the 18th centuries, the fair decayed during the Napoleonic wars, but revived thereafter. See Leipzig.

Leiria. District of Portugal. In the prov. of Estremadura, it is bounded on the W. by the Atlantic. It is traversed from N. to

by a steep hill crowned with the picturesque ruined castle founded in 1135 and transformed into a palace by King Diniz. In the castle grounds is an early Gothic church. The cathedral, a bishop's seat, founded in 1571, was modernised in the 18th century. Glass making and iron founding are carried on. The Roman Calippo, Leiria was captured from the Moors in 1135, but repeatedly changed hands. The Cortes (parliament) met here in 1354, 1376, and 1436, and the first printing press in Portugal was set up here in 1466. Pop. 5,929.

Leishman, Sir William Boog (1865-1926). British pathologist. Born Nov. 6, 1865, he was educated at Glasgow university. In 1889 he entered the army, and became professor of pathology at the army medical school. During the First Great War he was chosen director of pathology at the school, becoming director-general 1923. In 1909 Leishman was knighted. A genus of protozoa, Leishmania, was named after him, one species being the parasite of kala-azar, discovered by him in 1903. He also did research in blackwater fever and the relapsing fever of West Africa, and in the prevention and treatment of disease by vaccines. He died June 2, 1926.

Leiston. Town and urban dist. of Suffolk, England, the full name

S. in the centre of the district by a range of hills, the land sloping gently to the sea, and is watered by several short rivers. The capital is Leiria. Area 1,317 sq. m. Pop. 353,675.

Leiria. City of Portugal, the capital of the dist. of Leiria. It stands on the river Liz, 76 m. direct N. of Lisbon, dominated

of the urban district being Leiston-cum-Sizewell. It is 4 m. E. of Saxmundham, with a station on a branch railway. It has a modern church. A farming centre, it makes agricultural implements. Near the town are ruins of an abbey founded in the 12th century for the Praemonstratensian canons. Sizewell is a village on the coast, which gives its name to Sizewell Bank, a shoal 6 m. long, and to Sizewell Gap. Pop. 4,184.

Leitch, Charlotte Cecilia Pitcairn (b. 1890). A British golfer, known as Cecil Leitch. Born at Silloth, she came into prominence in 1908 at St. Andrews, when she was in the semi-final for the ladies' open championship. She first won the latter at Walton Heath in 1914, and retained the title in 1920 and 1921; but was defeated in the English ladies' championship by Joyce Wethered in 1920 and by the same player in the open championship in 1922. In 1926 Cecil Leitch again won the latter event. Five times champion of France, she held the record for a ladies' drive, 254 yds.

Leith. Seaport of Edinburgh, since 1920 part of that city. It stands on the S. shore of the



Leith arms

Firth of Forth, 2 m. N. of the capital, with which it is connected by Leith Walk. It is divided into two parts, N. and S., by the water of Leith. It elects

one of the Edinburgh M.P.s. The chief churches are S. Mary's, the parish church of South Leith, a 15th century building restored in 1852, S. Thomas's, a modern building, the fine episcopal church of S. James, in the Early English style, and the R.C. church. Among the chief buildings are the town hall, Trinity House, custom house, and corn exchange; also several hospitals and the sailor's home. Leith academy is the principal school. Leith Links is an open space; Leith Fort an artillery



Leith, Scotland. The port of Edinburgh as seen from Calton Hill

centre. One of the chief ports on the E. coast of Scotland, Leith has both wet and dry docks in its extensive harbour. Ships sail regularly to other ports of England and Scotland and to many in Europe. Industries include ship-building, brewing, distilling, sugar refining and chemical works, also the making of rope and biscuits.

The harbour of Leith was granted by Robert Bruce in 1329 to the citizens of Edinburgh, and it was soon a thriving port. This led to attacks by the English, and several times the shipping here was damaged. Leith was protected by walls, and in 1559, as the headquarters of Mary of Guise, was besieged by the Protestants. It had a tolbooth and a citadel, but both have been pulled down. In 1833 it was made a burgh independent of Edinburgh, but in 1920, after much resistance had been overcome, it was again included in the city and its council disappeared. Its pop. was then 80,000. Market day, Wed. See Edinburgh.

Leitha. A river of Austria. It rises between Höhenberg and Gutenstein in Lower Austria, and flows past the Schneeberg, and in a long curve E. of Wiener Neustadt to Bruck an der Leitha, whence it bends to flow S.E. to join the Danube in Hungary. In the days of the Dual Monarchy the cis-Leithan provinces represented Austria and the trans-Leithan provinces Hungary.

Leith Hill. An eminence in Surrey, 965 ft. high, the loftiest point in S.E. England. It forms part of the Lower Greensand ridge, near Dorking. The view from the top includes the scarped face of the S. Downs beyond the almost level expanse of the Weald. On the summit is a tower built in 1766 by Richard Hull, and restored in 1863. In 1923 tower and five acres of land were bought for the nation.

Leitmeritz OR LITOMERICE. A town of Czecho-Slovakia, in Bohemia. It stands at the head of steamboat navigation on the Elbe, 34 m. by rly. N.W. of Prague. Among the principal buildings are the cathedral, the old town hall with a Roland statue, and the Kelchhaus, 16th century, so called because of its curious cup-shaped tower. The main industry of the town is brewing, while the exceptional fertility of the district, known as "The Garden," brings a considerable trade in wine and fruit. Leitmeritz was transferred to Germany in 1938 as part of Sudetenland. Pop. 18,509.

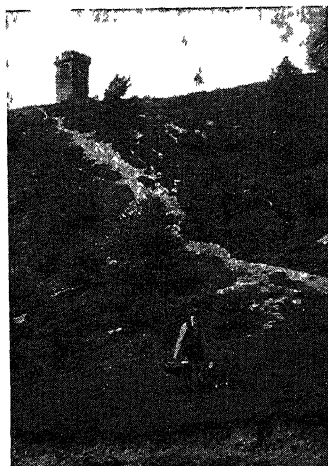
Leit-Motiv (Ger., leading motive). Oft-recurring phrase in a musical work, especially an opera, giving, as it were, the key to the prime sentiment of the work, and serving to illustrate abstract ideas or identify persons in the drama. It will appear at various times and in various forms. Examples are the Pilgrims' Chorus in Wagner's *Tannhäuser* and the Warders' Chorus in Sullivan's *Yeomen of the Guard*.

Leitrim. County of Eire, in the prov. of Connacht. It has a short coastline, about 3 m., on Donegal Bay. Its land area is 589 sq. m., and it is divided into two parts by Lough Allen. The Shannon forms its S.W. boundary; another river is the Bonet. There are hills in the N. and E. where the scenery is beautiful, and a number of loughs, among them Macnean, Melvin, and Scur. The soil is not very fertile, but cattle, pigs, and poultry are reared, and oats and potatoes are cultivated. A little coal is mined. The Eire State rlys. serve the co. Carrick-on-Shannon is the county town. Other places are Manor Hamilton, James Town, once represented in the Irish parliament, also Ballinamore and Mohill. Leitrim was known in the



Leitrim arms

N. and E. where the scenery is beautiful, and a number of loughs, among them Macnean, Melvin, and Scur. The soil is not very fertile, but cattle, pigs, and poultry are reared, and oats and potatoes are cultivated. A little coal is mined. The Eire State rlys. serve the co. Carrick-on-Shannon is the county town. Other places are Manor Hamilton, James Town, once represented in the Irish parliament, also Ballinamore and Mohill. Leitrim was known in the



Leith Hill, Surrey. South scarp of the hill, with the tower built by Richard Hull

Middle Ages as Brenny O'Rourke, the O'Rourkes being the chief family therein. The name Leitrim was taken from a place near Carrick, now a village. Four members are elected to the Dáil. Pop. 46,219.

Leix. A variant spelling of Laoighis (*q.v.*), official name of the Irish co. once known as Queen's.

Leixões. Harbour of Portugal, in the dist. of Porto. Situated 3 m. N. of the Douro estuary, it is the chief harbour of Oporto. It covers an area of 240 acres and accommodates large vessels. It dates from 1883, and a new harbour in the mouth of the Leca has been constructed. Pop. 13,500.

Lejjun OR EL LEJJUN. Modern name for Megiddo. It is a village on the south edge of the plain of Esdraelon, Palestine, where the British defeated the Turks, Sept., 1918. See Esdraelon, Plain of; Megiddo; Palestine, Conquest of.

Lek. River of the Netherlands. One of the distributaries of the Rhine delta, it extends from Arnhem to the Meuse, 7 m. E. of Rotterdam. During a part of its course it forms the S. boundary of the prov. of Utrecht.

Leland. CHARLES GODFREY (1824-1903). An American author. Born in Philadelphia, Aug. 15, 1824, he graduated at Princeton before studying at Heidelberg, Munich, and Paris. After taking part at the barricades with the Paris students in the revolution of 1848, he returned to America, where he advocated the freeing of slaves, and was called to the bar, afterwards beginning his study of gypsy life and language, and devoting himself to literature. He lived in London from 1869 to 1880, then, after a visit to America, was in Europe, dying at Florence, March 20, 1903.

In 1871 he published Hans Breitmann's Party and other Ballads, which achieved enormous popularity, and caused the author to be known as Hans Breitmann. Written in a mixture of English and German called Pennsylvania Dutch, they represent Leland's humour at its best. Besides translating the prose and poetry of Heine and some humorous German songs, he published books of verse, travel sketches, and gypsy studies, and wrote on art and folklore.

Leland, JOHN (c. 1506-52). An English antiquary. Born in London, he was educated at S. Paul's school, Christ's College, Cambridge, and All Souls College, Oxford. He was appointed king's



C. G. Leland,
American author
Elliott & Fry

antiquary by Henry VIII in 1533, and spent six years in searching abbeys, colleges, and other places for antiquarian records. Leland intended his collection to form the basis of History and Antiquities of This Nation, but he became insane through overwork, and died April 18, 1552, leaving a mass of MSS. His chief works are *Commentarii de Scriptoribus Britannicis*, *Collectanea*, and *The Itinerary*. The last-named, a valuable record of an antiquarian tour through England and Wales, was edited by T. Hearne, 1710-12, later edns. appearing 1906-07.



John Leland,
English antiquary

Leland Stanford Junior University. Institution in California, U.S.A. Leland Stanford (1824-93), a railway pioneer and horse breeder, governor of California, and a U.S. senator, founded the university in 1885 together with his wife in memory of their only child. Opened in 1891, it lies in a fine situation in grounds 14 sq. m. in area, near Palo Alto in Santa Clara co., about 30 m. S.E. of San Francisco. Most of the original building was destroyed in the earthquake of 1906. The endowment, estimated at \$36 millions, consists of land and securities. There are no fees for instruction and no religious qualifications. The university has nearly 6,000 students and a teaching staff of 700.

Le Locle. Town of Switzerland, in the canton of Neuchâtel. It stands in a valley traversed by the river Bied, 23 m. W.N.W. of Neuchâtel, at an alt. of 3,000 ft. Le Locle is a great centre of the watchmaking industry; the people are French-speaking and mainly Protestant. The town was destroyed by fire 1833. Pop. 11,336.

Lely, Sir Peter (1618-80). Anglo-Dutch portrait painter. Born probably at Soest, near Utrecht,



Sir Peter Lely,
portrait painter
Self-portrait

Sept. 14, 1618, he was the son of a soldier, Johan van der Faes, nicknamed Lely. After studying art in Holland, Peter made his home in England in 1641, and there he

remained in favour both at the court of Charles I and during

the Commonwealth. Charles II knighted him and made him court painter. He died Nov. 30, 1680, and was buried in S. Paul's, Covent Garden. With great and distinctive skill, Lely painted most of the English notables of his time. His best work is perhaps his gallery of court beauties, now at Hampton Court. The admirals, now at Greenwich, painted for the duke of York, afterwards James II, include the duke himself and other commanders at the naval victory over the Dutch in Sole Bay. See *illus.* Charles II; Cleveland, Duchess of; Clifford of Chudleigh; Cotton, Charles; Dundee, Viscount; Gwynn, Nell; Harman, Sir J.

Lemaître, François-Élie-Jules (1853-1914). A French man of letters. He was born at Vennecy, Loiret, April 27, 1853. After acting as professor successively at Havre, Algiers, and Tours, he went to Paris. His first volume of poems, *Les Médailles*, 1880, was followed by a literary



study, *La Comédie après Molière*, 1882, and another volume of poems, *Petites Orientales*, 1883. In 1884 he made a marked success as contributor to the *Revue Bleue*; and in 1888 joined the staff of the *Journal des Débats*, with which most of his work was thenceforward associated. His essays on literature and the drama were collected in successive volumes as *Les Con-*

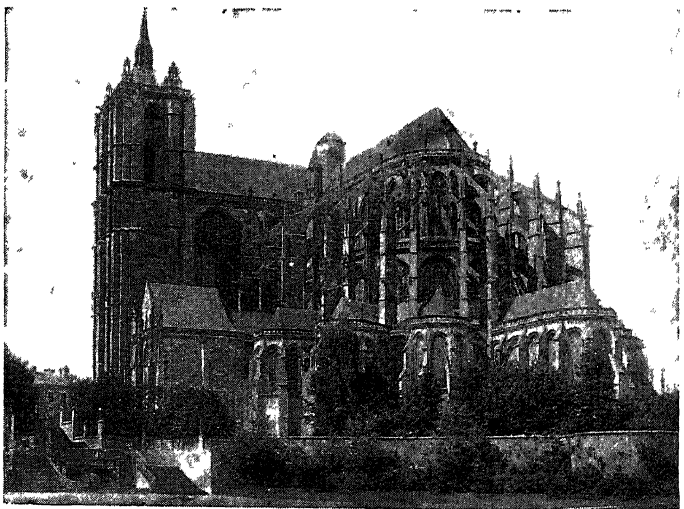
temporains, 1887, etc., and *Impressions de Théâtre*, 1889, etc.

In 1891 Lemaître began his career as dramatist with a political piece, *Le Député Leveau*, and later produced many plays (and duly criticised them himself in his weekly essays). He wrote charming stories, including *Sérénus*, 1886; *Dix Contes*, 1889; *Myrrha*, 1894. In 1895 he was elected a member of the Academy. His greatest work is in his fine, balanced, and individual criticism, which greatly influenced the public taste. He died Aug. 6, 1914. Consult *Jules Lemaître*, H. Bardeaux, 1920.

Leman, Lake. Alternative name for the lake of Geneva (*q.v.*).

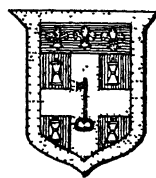
Leman, Géraert Mathieu Joseph Georges (1851-1920). Belgian soldier, born Jan. 8, 1851. When the First Great War broke out he was a lieutenant-general in charge of the fortress of Liège, the defence of which he directed against the Germans. When they were completing the conquest of Liège, Leman was found unconscious in Fort Loncin, and was taken prisoner, Aug. 15, 1914. To his captors he said, "Put in your dispatches that I was unconscious." He died Oct. 17, 1920.

Le Mans. A town of France. The capital of Sarthe dept., it lies 130 m. S.W. of Paris on the rly. to Brest. Occupying the site of ancient *Suindinum* or *Vindinum*, it was a walled town under the Romans in the 3rd century when evangelised by S. Julien. Taken by William the Conqueror in 1063, it continued in the possession of the English, whose king Henry II was born there. During the Middle Ages the capital of the counts of



Le Mans. Gothic cathedral of S. Julien seen from the east

Maine and several times besieged, it was occupied by the Vendéens during the French Revolution.



Le Mans arms

Gen. Chanzy was defeated here by the Prussians in Jan., 1871.

Built above the confluence of the Sarthe and Huisne, Le Mans has a number of bridges. The Gothic cathedral of S. Julien contains some of the oldest stained glass in France, also tapestries and the tomb of Berengaria, wife of Richard I. Ancient churches include that of La Couture. The hôtel de ville (1756) is on the site of a castle of the counts. Le Mans has a state manufactory of tobacco, tanneries, bell foundries, flour mills, and makes rly. wagons, agricultural implements, rope, etc.

Le Mans was the scene of the annual motor Grand Prix, one of the most famous races in Europe. Instituted in 1923, the prize went to the driver covering the greatest distance in 24 hrs. Pop. 100,455.

During the Second Great War this was h.q. of the B.E.F., Sept. 14-22, 1939. It was occupied by the Germans from June, 1940. Rail communications and an aircraft factory were attacked by Allied air forces, 1943-44; the town was liberated in a rapid advance by U.S. armoured forces, Aug. 9, 1944.

Lemberg. Austrian name of town described in this work under its Russian name Lvov.

Lemercier, JACQUES (c. 1585-1660). French architect and sculptor. Born at Pontoise, he is believed to have visited Rome about 1607. On his return he became Richelieu's favourite architect, and adapting himself faithfully to the Jesuit manner, designed for his master the Oratory of the Rue S. Honoré, the Sorbonne, the Hôtel de Richelieu, and other buildings of historic importance.



Jacques Lemercier, French architect

Lemery, NICOLAS (1645-1715). French chemist. Born at Rouen, Nov. 17, 1645, he studied under Christophe Glaser in Paris and became a popular lecturer on chemistry, breaking away from the old alchemist traditions. Obligated as a Calvinist to leave Paris, 1683, he was allowed to return, 1686, and to

resume his lectures. He published, 1675, *Cours de Chymie*, a work that remained for many years a standard. He died June 19, 1715.

Lemming. A genus of small rodents. They are found in N. Europe, Asia, and America. The European lemming (*Lemmus lemmus*) is about 5 ins. long, and yellowish brown in colour. It is extremely common in Norway, living in burrows and feeding on grass and moss. For some unknown reason the lemmings migrate to the sea at intervals of 3 or 4 years. In countless hordes they descend



Lemming. The small rodent with remarkable migratory habits

hills and make their way across country in spite of every obstacle, eating their way through the fields of corn. Although at other times they display the utmost aversion to water or damp ground, during this migratory movement they swim rivers and lakes, and march on steadily till they reach the sea, into which they plunge and swim till drowned.

Lemnaceae. Small family of minute annual plants. They are natives of all regions where there are standing waters. Each plant consists of a green, floating scale, with or without simple roots, and is mainly propagated by offshoots. Flowers are rare, unisexual, and very simple, consisting of one or two stamens or a pistil. The three genera are *Spirodela*, *Lemna*, and *Wolffia*, familiarly known as duckweeds (*q.v.*) or duckmeat.

Lemniscate (Gr. *lemniscos*, ribbon). In mathematics, name given to a quartic curve discovered by Jacques Bernoulli. It is the locus of a point which moves in such a way that the product of its distances from two fixed points is equal to the square of half the distance between the points. In shape the curve resembles a figure eight.

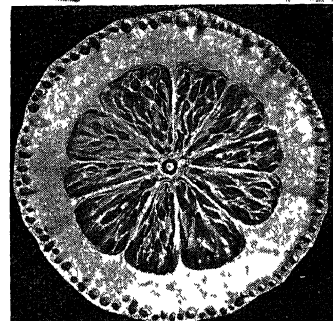
Lemnos or **LMNOS**. A Greek island of the Aegean Sea. Lying S.W. of Imbros, off the coast of Asia Minor, it is about 45 m. W. of the S. entrance to the Dardanelles. Two deep bays, Port Paradise on the N. and Port St. Anthony on the S., almost bisect the island, whose area is 180 sq. m. A famous product was Lemnian earth, used as an antidote for poison and the plague by the ancients, and valued

highly by both Turks and Greeks until recently. Lemnos produces grain, fruits, and tobacco. The chief town is Kastro or Lemnos, the ancient Myrina. The island was taken from Venice by the Turks in 1478.

In Mudros Bay, on the S. side of the island, the Allied fleet had its base for operations against Turkey during the First Great War and it was here that the Turks were granted an armistice in Oct., 1918. After their conquest of Greece, the Germans seized Lemnos on April 25, 1941, and held it until British troops landed on Oct. 16, 1944, taking Mudros and clearing the island next day. See Aegean Sea; Gallipoli, Campaign in.

Lemon (Arabic, *limoun*). Small evergreen tree of the family Rutaceae. It is a native of the East Indies, with oblong leaves and fragrant white flowers. Botanically it is the var. *limonum* of the species *Citrus medica*, which appears to have been cultivated in its various forms in India from ancient times, and is still found in the wild state in N. India. The lemon was not known to Greeks or Romans; but the conquering Arabs brought it into Egypt and Palestine in the 10th century. From Palestine it probably reached Italy, where it is chiefly cultivated, by the agency of the returning crusaders, the name taking the form *limoné*. Later it reached the W. Indies, where it now grows wild.

The fruit is really a large, ova-berry, with a nipple-like extension



Lemon. Diagram of transverse section of the fruit. Top, fruit and foliage of the tree

at the end opposite to the footstalk, the pulp and seeds enclosed in a thin, yellow rind. This skin contains numerous cells filled with the essential oil of lemon, which is obtained for use in medicine, perfumery, and confectionery by puncturing and pressure of the fresh rind. Two methods are in use for this purpose—the sponge process and the needle process. In the former the peel is pressed against a sponge which absorbs the exuding oil; in the needle or *écuelle* process a saucer-shaped vessel studded with sharp brass needles is used, the peel being rubbed over the needle-points, when the oil runs down into the saucer. These mechanical methods are preferred to distillation, owing to the impairing effect of heat on the quality of the oil. The essential oil or essence of lemon so obtained consists of about 90 p.c. of the terpene limonene and 6 or 7 p.c. of citral, to which the odour is due. The stearoptene known as citroptene is deposited in the form of crystals when oil of lemon is allowed to stand.

In addition to these products, the fresh fruit is used to make lemonade, a drink with diuretic properties and, since it contains Vitamin C, antiscorbutic. Lemons also yield citric acid (*q.v.*), which is present in the juice to the extent of about 6 or 7 p.c. A further use of the lemon is in the production of candied peel, for which purpose the fruit is cut in two, the pulp cleaned out, and the peel, having been cleansed by boiling, is saturated in successive baths of syrup, which permeates its tissues with sugar. At one time an almost exclusively Italian product, candied peel is now produced in Great Britain and the U.S.A. Lemons are grown commercially in Spain, Italy, Palestine, and the U.S.A.

Lemon, MARK (1809–70). British journalist and dramatist. He was born in London, Nov. 30, 1809, the eldest son of a hop merchant. Lemon was brought up at Hendon and educated at Cheam. After learning the hop business at Boston, he became manager of a brewery at Kentish Town. Having founded, he for a time edited, *The Field*; also *The London Journal*, *The Family Herald*, and *Once a Week*. With H. Mayhew he helped to found *Punch*, which he edited, 1843–70.



Mark Lemon,
British journalist

He began to write for the stage in 1835, and was author of some 60 plays, chiefly melodramas, operettas, and extravaganzas, the most notable being *Hearts are Trumps*, 1849. With Gilbert à Beckett he adapted *Dumanoir's* and *Denery's* *Don César de Bazan*. He was successful as an amateur actor. His versatility was further displayed by novels, including *Falkner Lyle*, 1866; fairy tales, essays, and *Mark Lemon's Jest Book*. Familiar as Uncle Mark, he won success as a lecturer and public reader. For many years an intimate friend of Dickens, he acted as intermediary on Mrs. Dickens's behalf at the time of the novelist's separation from his wife, 1858. Lemon died May 23, 1870.

Lemon Grass (*Cymbopogon citratus*). A grass of the family Gramineae, native of S. Asia.



Lemon Grass. Leaves and flowers

Its leaves, when bruised, emit a refreshing fragrance. In India they are roasted and used medicinally. By distillation a strong yellow essential oil, emitting a lemon-like odour, is obtained for use in rheumatic affections. The oil is widely

utilised in perfumery under the name of oil of verbena.

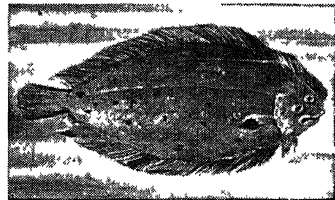
Lemonnier, ANTOINE LOUIS CAMILLE (1845–1913). A Belgian writer. Born in Brussels, March 24, 1845, he made his reputation as a follower of the realistic school of fiction, being influenced by Zola and the Goncourts; his novels of this period, such as *Les Charniers*, 1881; *Le Mort*, 1882; *Happe-chair*, 1886; *Madame Lupar*, 1888, made a considerable impression. The Belgian literary revival of those years owed much to his personality. In later works the harshness of his naturalism is modified, and a more sensitive imagination is found in such works as *L'Arche*, 1894; *Le Vent dans les Moulins*, 1901; *Comme va le Ruisseau*, 1903.



Antoine Louis Camille Lemonnier

Some works of art criticism include his study of Courbet, 1878. A tragedy, *Édénic*, was performed at Antwerp in 1912. Lemonnier died at Brussels, June 13, 1913. See Belgium: Literature.

Lemon Sole (*Microstomus Kitt*). A type of dab, belonging to the flatfish family. Common around



Lemon Sole. Specimen of the flatfish found off the coasts of Britain

the N. coasts of Europe and forming an important food fish, it is also known as the smear dab, its English name being a corruption of the French *limande* (dab). The true sole (*Solea solea*) belongs to a different family and is greatly superior in flavour and quality of flesh. Lemon soles are brownish yellow in colour on the upper side, with numerous small spots, and feed mainly on small crustaceans and molluscs. They are chiefly captured by trawling. See Fisheries.

Le Moyné, CHARLES (1626–83). French pioneer in Canada. Born in Normandy, he crossed to Canada as a boy, gained a close knowledge of the country and its native inhabitants, and fought in the early wars of the French settlers against both Indians and English. He was ennobled in 1668 when the feudal aristocracy of French Canada was set up, and died at Villemarie.



Charles Le Moyné,
French pioneer

Several of his sons were prominent French pioneers. Charles (1656–1729) became governor of Montreal, and was made baron of Longueuil. Jacques (1659–90) was an able soldier, killed in action against the English at Schenectady. Pierre, who was better known as the sieur d'Iberville (1661–1706), served in the French navy and fought at Schenectady, 1690, and in Hudson Bay, 1694 to 1697. He established fortified outposts on the Mississippi, and died at Havana, July 9, 1706. Joseph (1668–1734) also served in the French navy, and became governor of Rochefort in 1723. Antoine, sieur de Châteauguay

(1683-1747), fought against the British in 1705, and was governor of Martinique and Île Royale.

Lempa. A river of Central America, the longest on its Pacific coast. From its outflow from Lake Guja, on the borders of Guatemala, it follows an E. and S. course through Salvador and discharges its waters into the Pacific about 50 m. E.S.E. of San Salvador. Length about 200 m.

Lemprière, JOHN (c. 1768-1824). A British scholar. Born in Jersey, he was educated at Winchester and Pembroke College, Oxford, became a schoolmaster at Bolton, and was ordained. In 1792 he became headmaster of Abingdon grammar school, and in 1809 of one at Exeter. From 1800 he was vicar of Abingdon, and after leaving Exeter in 1811, held livings in Devon. He died Feb. 1, 1824. Lemprière is known for his *Classical Dictionary*, first published in 1788, then revised, enlarged, and improved by others. He compiled a *Universal Biography*, 1808.

Lemur (Lat., ghost). A suborder of the Primates. While closely allied to the monkeys and apes, it differs from them in many important respects, e.g. in appearance, for lemurs have an elongated snout, a median cleft in the upper lip, and large freely moving ears. Their fur is thick and they have bushy, brush-like tails. In general anatomical structure they are very near the monkeys. The brain is of a simple and distinctly lower type; the hand and foot are adapted for grasping; the incisor teeth of the upper jaw are separated by a gap; and the tail is never prehensile. The slit-like nostrils, quite different from those of monkeys, are at the tip of the muzzle, and closely resemble those of the dog.

Lemurs are most numerous in Madagascar, where alone the typical forms are found. Other genera occur in Africa, India, and the Malay Archipelago. Fossil remains of extinct genera have been found in Europe and America. They were at one time numerous in France, and have been traced in Great Britain. The name was given to the group by Linnaeus to describe the nocturnal and stealthy habits of the animals, which have caused them to become the objects of popular superstition.

With few exceptions lemurs live in the trees, rarely descending to the ground except for drinking or travelling from one copse to another. They feed upon fruit, leaves, insects, eggs, and small

birds; they are strictly nocturnal, passing the day asleep, and like most night animals have large and prominent eyes.

The group is divided into several genera and numerous species, differing greatly in size, colour, and shape. The largest are about the size of a fox, while the smallest is little larger than a mouse. In captivity they make gentle and often affectionate pets, but their



Lemur. Ring-tailed lemur of Madagascar

habit of sleeping during the day makes them rather uninteresting. See Animal; Aye-Aye; Galago; Loris; Primates.

Lemures. An ancient Roman name for the spirits of the dead generally. The good were called Lares or Manes, and the wicked Larvae, though some regard Lemures as equivalent to Larvae. They were exorcised at the annual festival called Lemuria, or Lemuralia, May 9, 11, and 13.

Lena. River of Asiatic Russia, in the R. Siberian region and Yakutsk A.S.S.R. It rises in the mountains 10 m. W. of Lake Balkal, and 190 m. N.E. of Irkutsk. Flowing N.E., then from Yakutsk N., it widens into an estuary and discharges itself into the Arctic Ocean, after a course of 2,875 m. The sands of its tributary, the Vitim, are rich in gold, and on its banks are lead, iron, copper, salt, coal, and sulphur mines.

In 1908 a British company, Lena Goldfields, was formed to acquire a 70 p.c. interest in the Lena Gold Mining Co. established in Russia in 1863 to work deposits in the Vitim district. After the Russian revolution in 1917, the Lena Gold-mining Co. was nationalised, but in 1925 the Soviet govt. granted the British co. a 30-year concession. In 1928 the government cancelled the concession and offered the com-

pany £800,000 in compensation, which was refused. Arbitration courts awarded the company £13,000,000; this finding was rejected by the Soviet, but eventually an agreement was signed on Nov. 4, 1934, whereby the company accepted a payment of £3,000,000 spread over 8 years. Payment, suspended during the Second Great War, was completed in 1946.

Lena. Archipelago or group of islands at the mouth of the river Lena. They are formed by the deltaic system of that river, where the distributaries enter the Nordenskiöld Sea in the Arctic Ocean.

Le Nain. Name of a family of French painters, Antoine (c. 1588-1648), Louis (1593-1648), and Mathieu (1607-77). These brothers were all born at Laon, where they received their early instruction in art. They went to Paris c. 1629, and in 1630 Antoine was received as master painter of the guild, and Louis and Mathieu as "companion" painters. They were all admitted to the Academy in 1648. The brothers' usual subjects were domestic genre and portraits, and Louis and Antoine frequently collaborated in the same picture; one or two religious subjects are ascribed to them. Their work is true to nature, and without the heaviness of much Flemish genre of the period. They excelled especially in cabinet-size pictures, where the figures are always well drawn, grouped, and lighted. Mathieu painted the portraits of Anne of Austria, Mazarin, and others.

Lenard, PHILIPP (1862-1947). German physicist. Born June 7, 1862, at Pressburg (Bratislava), he was trained by Bunsen at Heidelberg and was professor there 1907-31. He worked on cathode rays, fluorescence, and the conduction of electricity in gases. He was awarded the Nobel prize for physics, 1905, and was later an opponent of Einstein's theory of relativity. Lenard died June 20, 1947.

L'Enclos, NINON (ANNE) DE (1616-1705). French courtesan. Born in Paris, May 15, 1616, she was the gifted daughter of a



Ninon de L'Enclos, French courtesan After G. P. Harding

landowner of Touraine. She was brought up by him in an atmosphere of dissipation, and soon became the intimate of a succession of distinguished men who were at-

tracted more perhaps by her wit than by her beauty. Among those said to have been her lovers were St. Evremond, Condé, Sévigné, and La Rochefoucauld, and she certainly had great influence in Parisian society. She died Oct. 17, 1705. *Consult* The Immortal Ninnon, C. Austin, 1929. *Pron.* Longlo.

Lend-Lease. The term adopted in this encyclopedia is Lease-Lend.

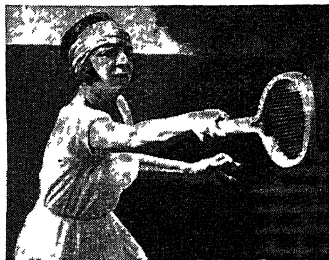
Lenepveu, JULES EUGÈNE (1819-98). A French painter. Born at Angers, Dec. 12, 1819, he studied under Picot, and in Italy. He first exhibited at the Salon in 1843, became a member of the Académie des Beaux Arts in 1865, and directed the Ecole de Rome, 1872-78. His easel pictures comprised historical and religious subjects and portraits; one may cite *A Venetian Wedding*, 1857, *Moses Succouring the Daughters of Midian*, 1859, and *Hylas*, 1865. In later life he devoted himself to mural decoration, contributing important works to the Panthéon and the churches of S. Clotilde and S. Sulpice in Paris.

Leng, SIR JOHN (1828-1906). A British newspaper proprietor. Born April 10, 1828, at Hull, and educated at the local grammar school, he started journalism as a contributor to *The Hull Advertiser*, of which he was sub-editor, 1847-51. Editor and part proprietor of *The Dundee Advertiser*, he turned it from a bi-weekly into a daily in 1861 and made it one of the leading Scottish newspapers. He was the first to experiment with illustrations in a daily paper, and started *The People's Journal*, 1858; *The People's Friend*, 1869; and in 1877 *The Evening Telegraph*, which became *The Evening Telegraph and Post*, 1905. Leng was Liberal M.P. for Dundee, 1889-1905. Knighted in 1893, he wrote on his travels in Europe, the East, Canada, and the U.S.A., He died at Delmonde, Cal., Dec. 12, 1906.

Leng, SIR WILLIAM CHRISTOPHER (1825-1902). British newspaper proprietor. Born at Hull, Jan. 25, 1825, he was apprenticed to a wholesale chemist in 1839, and was in business for himself, 1847-59. During 1859-64 he was a writer on his brother John's paper, *The Dundee Advertiser*. He held strong views on municipal reform, helped Samuel Plimsoll to secure the load line (*q.v.*) on cargo vessels, and figures as Holdfast in Reade's novel, *Put Yourself in His Place*, 1870. In connexion with *The Sheffield Telegraph*, which from 1864 he owned and edited, he was

the first to set up linotype machines; and he started *The Sheffield Evening Telegraph and Star*, 1887; *Weekly Telegraph*, 1888; *Weekly News*, 1899. He was knighted in 1887 and died Feb. 20, 1902.

Lenglen, SUZANNE (1899-1938). French lawn tennis player, born May 24, 1899, at Compiègne. She



Suzanne Lenglen, French lawn tennis player, who set new standards of play for women

sprang to fame by winning a championship in 1914, and held that of her country 1920-23 and 1925-26. At Wimbledon she won the ladies' singles each year from 1919 to 1923 and in 1925. No rival defeated her in this period; few took a set. She was also supreme in doubles with Elizabeth Ryan. In 1926 she turned professional. She was probably the quickest and most brilliant, certainly the most temperamental, of all women players of the game. After her death, July 4, 1938, she was awarded the legion of honour. *Pron.* Long-lon.

Lenham Beds. In geology, name given to Pliocene (*q.v.*) rocks at Lenham, Kent. They belong to the older Pliocene period.

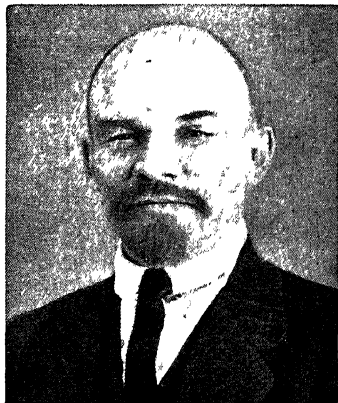
Lenin, VLADIMIR ILYITCH (1870-1924). Russian revolutionary and statesman. Born at Simbirsk (renamed Ulyanovsk) on the Volga, April 22 (N.S.), 1870, he was the third child of an inspector of schools named Ulyanov and his Volga-German wife. While still at Simbirsk gymnasium he began to read Marx. In 1887, his last year at school, where he secured the gold medal in his final examinations, his elder brother Alexander was hanged for participation in a students' plot against the life of the tsar. His brother's death turned Vladimir's thoughts more seriously to consideration of revolution and how to achieve it. He entered Kazan university, but within a few months was expelled for taking part in a students' demonstration. In 1891 he was permitted as an outside student to take the final law examinations at St. Petersburg, passing first out of 124. For two years he prac-

tised in Samara (renamed Kuibishev), his revolutionary faith deepening meanwhile. When he left Samara in 1893 he changed his name to Lenin.

Four years later Lenin was convicted of complicity in the production of illegal newspapers, and sentenced to three months' imprisonment, followed by three years' exile in Siberia. There he was joined in 1896 by Nadezhda Konstantinovna Krupskaya, whom he had met in St. Petersburg in 1894. They married, and his wife became his lifelong helper. In 1900, his sentence completed, he went to Munich, whither his wife followed him; together they produced the newspaper *Iskra* (The Spark). In 1902 he moved to London, where he met Trotsky. Moving to Geneva in 1903, during the next two years he attended a series of international socialist conferences at which he established a reputation as an extremist.

It was at a London congress in 1903 that Lenin, a strict Marxist, obtained a majority (Russ., *bol'sheviki*) for the programme he and Plekhanov had drawn up; it repudiated the policy of collaboration with the liberal bourgeoisie favoured by the minority (Russ., *mensheviki*). The words Bolshevik and Menshevik acquired a new significance as, respectively, the names of violent revolutionaries and of moderates in the Russian socialist movement.

Defeats inflicted on Russian arms by Japan increased unrest in the country, whither Lenin returned, to found *The New Life*, the first socialist newspaper published openly in Russia. In Dec., 1905, an armed rising in Moscow was rapidly crushed, and the revolutionary movement was broken. In 1907 Lenin again went into



Lenin, Vladimir Ilyitch Ulyanov, the Russian Bolshevik leader

exile, living in Paris, Vienna, Zürich. He worked steadily for revolution, and in Nov., 1914, declaring the First Great War to be imperialistic, he denounced socialist support of it; a view accepted by an international conference of socialists opposed to the war which was held at Zimmerwald in Sept., 1915.

Return to Russia

When the revolution of March (N.S.), 1917, occurred, Lenin was permitted by the Germans (who foresaw the chance of ridding themselves of their eastern front) to cross Germany in a sealed railway coach. He arrived in Petrograd on April 16 (N.S.), 1917. The tsar's government had fallen, and under a succession of weak and scared Liberal ministries the country was in chaos. Lenin had a plan. His caustic comments cut through the untimely jubilation of the comrades who came to welcome him, and clearly exposed their desperate situation. He put himself at the head of the extremists, and began to attack the moderately socialist provisional government of Kerensky. The failure of the new military offensive, launched, on Allied insistence, by the almost weaponless Russian army, led to popular risings in July, and Kerensky ordered the arrest of the Bolshevik leaders; but Lenin escaped into Finland. Soon the Bolsheviks were in control of the Moscow and Petrograd soviets; then the fleet and army mutinied; and on Nov. 8 (Oct. 25 O.S.) Lenin reappeared. In the course of one night Kerensky was deposed and a soviet of people's commissars was set up, with Lenin at its head.

The new dictator of Russia was faced with appalling difficulties. The Germans were smashing their way through the defenceless and demoralised Russian armies; starvation threatened the people; there was no longer any administrative machinery of government. Only in the large towns were the Bolsheviks firmly established. The industrial workers, on whom Lenin relied, numbered some 1,400,000—1.2 p.c. of the population; and the country was soon plunged into civil war. In a desperate position, with only central Russia left to him, Lenin insisted that peace with the Germans must be concluded, and, in spite of opposition, signed the harsh terms imposed at Brest-Litovsk. Two British expeditions threatened him from Archangel and Baku; subsidised ex-generals

of the old Imperial army, Koltchak, Denikin, and Wrangel, were setting up military governments in the south and the east.

Lenin's oratory roused the masses, his diplomacy played off one adversary against the other; discipline was established, food supplies were well organized. Bolshevism, or Communism as Lenin called it, attracted many disciples through these achievements. If Lenin's methods were pitiless, it was because he was convinced that no other methods would have succeeded. The new Red armies, fighting for the revolution, gradually beat back their enemies. Order was restored.

Lenin himself lived in constant danger. He surrounded himself with a bodyguard of Lett Bolsheviks and Chinese mercenaries; but in spite of precautions, on Aug. 30, 1918, he was fired at and hit twice as he was on his way to a workers' meeting. He recovered within two months. The attack served to intensify the fervour of his followers.

By 1921 the counter-revolution was crushed, and Lenin now abandoned the radical war communism he had considered essential, replacing it by the so-called new economic policy (N.E.P.). Aiming at the restoration of production and trade, it admitted a certain amount of private enterprise and profit. Trade treaties were concluded with capitalist countries, including one with Great Britain in 1921. But Lenin's health was beginning to fail. In 1922 there were signs of sclerosis of the cerebral arteries, and his doctors forbade him daily work. Throughout 1923 the disease grew worse. He began to lose the power of speech, and in Dec. paralysis attacked his right arm and leg. On Jan. 21, 1924, he died at Gorki, near Moscow.

His body was exposed in an open coffin in Theatre square, Moscow, and tremendous crowds filed past to pay their tribute to his memory. The supreme soviet had his brain removed for examination, and decided that his body should be

embalmed and preserved for all time, in the words of Emil Ludwig, "not a mummy, but a living piece of sculpture." The sepulchre of dark stone stands in Red square, Moscow; under a cupola, in a glass coffin, the body of Lenin lies dressed in grey uniform. Every day thousands of pilgrims pass through the mausoleum.

Lenin was a strict theorist with the will, the strength, and the energy to put his theories into practice in the face of all opposition. In that lies the secret of what his critics have condemned as his cold-blooded brutality. Able to conserve his energy, gifted with great powers of concentration, after his accession to power he lived a life as simple as that of his early days as a political exile.



Lenin. Tomb of Lenin in Red Square, Moscow; his embalmed body is in the building in foreground

He believed passionately in the social value of technical and scientific improvements. "A single technical expert," he wrote, "is worth ten communists."

His political doctrine, based on the application of the Marxist analysis to those forms of capitalism which had developed between Marx's time and his own, was as follows. The interests of the comparatively small capitalists whom Marx had attacked had become concentrated into huge trusts and combines; these, inevitably gaining control over the governments, drove them to policies of imperialistic expansion in search of new markets and of raw materials. Rival imperialisms inevitably came into conflict, producing ever greater wars until a revolution of the working classes overthrew the capitalists and set up international communism in their place. Lenin agrees with Marx in regarding the state as the instrument of the

ruled class, and Leninism insists on the initial necessity of violent revolution in order to overthrow the existing order. It considers, however, that the majority must be won over, at least to acquiescence, by propaganda. The parliamentary state, the concealed dictatorship of the capitalist class, must be replaced by a dictatorship of the proletariat; as class distinctions vanish and general welfare increases, the proletarian state will pass into a stateless communist society.

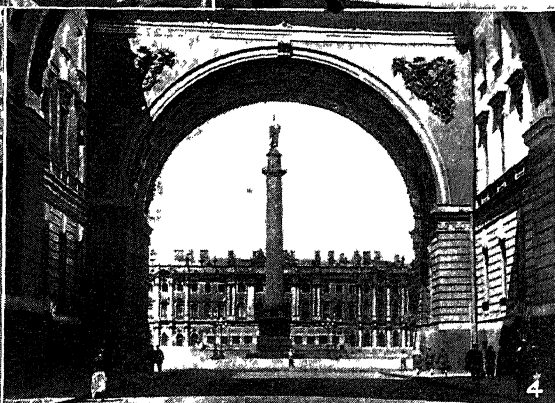
Bibliography. Of the nineteen volumes of Lenin's collected works, only five have been translated into English. A German edition, *Ausgewählte Werke Sammelband*, was published in 1925; *The Essentials of Lenin*, 2 vols., 1947, consists of extracts from his writings. Consult also Lenin, L. Trotsky, 1925; *Ten Days That Shook the World*, J. Reed, 1926; *Leninism*, J. Stalin, 1928; *Memoirs of Lenin*, N. K. Kroupskaia, 1930; *Lenin*, D. S. Mirsky, 1931; *Days with Lenin*, M. Gorki, 1932; *Lenin*, J. Maxton, 1932; *Lenin*, R. Fox, 1933; *To the Finland Station*, E. Wilson, 1940.

Leninakan. Town of Armenia S.S.R. Situated about 80 m. S.W. of Tbilisi, it was formerly known as Alexandropol. The town is a rly. junction, being on the Tbilisi-Tabriz line and having a branch line to Kars, Turkey. A large electric power station has been erected here. In 1926 the town and surrounding district were severely damaged by an earthquake. Pop. 67,707.

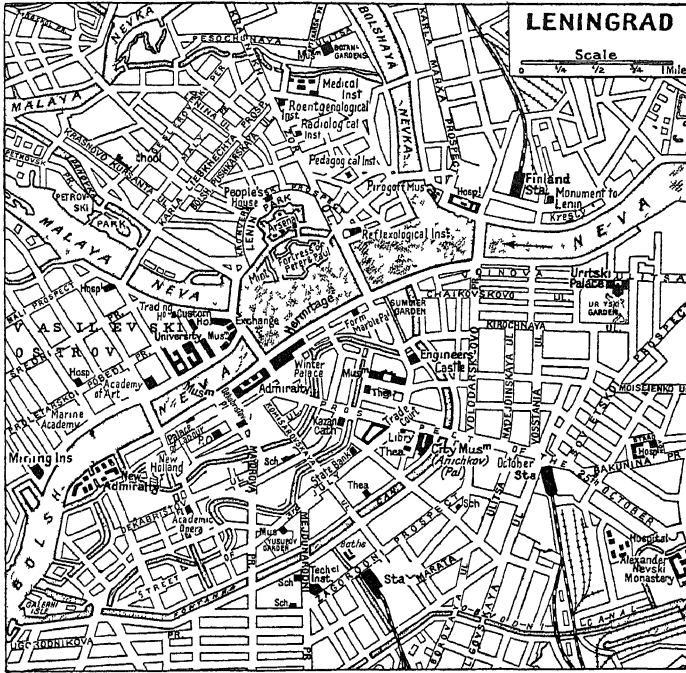
Leningrad. City, which gives its name to a region of the R.S.F.S.R. Formerly the capital of the Russian empire, Leningrad was known until 1915 as St. Petersburg and from 1915 to 1924 as Petrograd. Situated on a swamp of the R. Neva and at the head of the gulf of Finland, its main part lies on the left side of the river, S. of the fortress of Peter and Paul on the islet which was the original site of the city. It covers an area of 35 sq. m., and is divided into 13 districts. The Neva, 40 m. long, flows from Lake Ladoga past the city. Beyond the Alexander bridge it divides into three distributaries, and falls

into the gulf of Finland. The channels are spanned by numerous bridges. The city is drained by four canals, Moika, Catherine, Fontanka, and Obvodni. During the rainy season floods are frequent. From Nov. to April the river is ice-bound.

Leningrad has more claim to be a European city than any other in Russia. The Prospekt of 25 October, also called Nevsky Prospekt, which intersects the city in an almost straight line from the Admiralty to the Alexander Nevsky monastery, turning abruptly at the Moscow rly. station, contains the Kazan cathedral, modelled on S. Peter's at Rome; Anichkov palace, now the city museum; the city hall; and the Gostini Dvor, a once-noted shopping centre. Other notable buildings are the winter palace (now a palace of arts), a one-time residence of the tsars, the Taurida palace, S. Isaac's cathedral, and the Hermitage (*q.v.*). The cathedral of S. Nicholas, built in 1760, has been restored. The Lyētniy Sad, or summer garden, on the left bank



Leningrad, R.S.F.S.R. 1. The city from the roof of S. Isaac's Cathedral; on the right is seen the Neva. 2. S. Isaac's Cathedral. 3. October 25 Prospekt, also called Nevsky Prospekt. 4. Winter Palace, now a palace of arts, seen through the Red Army arch



Leningrad. Plan of the former imperial capital of Russia

of the Neva, may be called the Hyde Park of Leningrad. Adjacent is the field of Mars, where the victims of the revolution of 1917 were interred. The fortress of Peter and Paul contains the state prison, the mint, and the arsenal. In the vaults of the cathedral of SS. Peter and Paul are buried the emperors with the exception of Peter II and Nicholas II.

The islands which form the delta of the Neva number about 100. The most important one is Aptekarski or Apothecary Island. It contains the imperial botanical gardens laid out by Peter the Great in 1713.

Leningrad possesses a number of schools and institutes of learning. The most noted are the university, founded by Alexander I in 1819, a technological institute, the naval and military academies of law and medicine, besides schools of forestry, mining, and engineering, and the conservatory of music where Rubinstein taught. There are also progressive schools for the higher education of women. With Moscow, it was the chief manufacturing centre of the U.S.S.R. in 1939, but under the second five-year plan the building of new plants was discouraged, and its relative importance has declined. The city is a centre of production of electrical machinery and machine tools,

textiles, clothing, and leather; and shipbuilding is also an important industry.

The land on which the city lies formed part of the ancient territory known as Ingermanland or Ingria. It belonged to Novgorod and Moscow; then to Sweden; and was reconquered by Peter the Great in 1702. With the object of bringing Russia closer to W. Europe, he determined to build a

new capital at the mouth of the Neva which was to be a "window to look out into Europe." The first stone was laid in 1703, on the site of what is now the fortress. Fifty years later the city numbered 80,000 inhabitants. After the defeat of the Swedes at Poltava, 1709, St. Petersburg became the capital of Russia.

The first rly. line to Moscow was laid by Nicholas I. Railways run direct to the Murmansk coast and to Perm, with a branch to Archangel. Leningrad harbour is connected with its outpost, Kronstadt, by a ship canal 18 m. long and 23 feet deep, constructed through the sandbanks in the shallow waters of the head of the gulf of Finland; ice-breakers keep it open except in the severest winters. The Stalin canal connects Leningrad with the White Sea.

As Petrograd, it was the scene of the revolution, March 12, 1917, and here in Sept., 1917, a republic was first proclaimed. After the Bolshevik coup d'état in Nov. (Oct. O.S.), 1917, the soviets took over the administration, making the Smolni institute their headquarters. The city ceased to be the capital (Moscow replacing it), March 14, 1918, and was proclaimed a free port. After the death of Lenin (q.v.) the city's name was changed to Leningrad, March, 1924. In the Second Great War the city endured a prolonged siege (v.i.) by German and Finnish forces. Aerial and artillery bombardment caused great damage over a wide area. Pop. (1939) 3,191,304.

LENINGRAD: SIEGE OF, 1941-44

Paul Winterton, former Moscow Correspondent, *News Chronicle*

Of the heroic stories of the fighting on the Russian front in the Second Great War, that of the siege of Leningrad ranks very high in its courage, endurance, and moral importance. See Russo-German Campaigns; also Ladoga illus.

On Aug. 18, 1941, the German army of von Leeb, advancing on Leningrad, inflicted a disastrous defeat on the Russians at Kingisepp and drove Marshal Voroshilov's forces back to the first ring of the city's defences. Three days later, Voroshilov, Zhdanov (Leningrad's political leader), and Popkov (the mayor) declared the city in danger and called the people to its defence. Home guard and factory workers' divisions were hurriedly thrown into the struggle at the gates, and despite an order of the day by von Leeb on Sept. 10 that the city must be taken immediately at all costs, the defences held. Before the end of Sept.,

however, the Germans had completed their enveloping movement by a thrust which captured the key fortress of Schlüsselberg on the southern tip of Lake Ladoga, E. of the city. The siege, which was to last more than two years, had begun. Leningrad was cut off to the N. by the Finns, who held a line across the Karelian isthmus; to the S. by the Germans; and to the E. by the great inland sea of Lake Ladoga. Communication across the lake would soon be interrupted by ice, and was already made difficult by military operations farther E. From Nov. 11, when the Germans captured the rly. junction of Tikhvin, until

the Russians retook it Dec. 8, there was no communication between Leningrad and the rest of Russia except by transport plane.

Of Leningrad's pre-war pop. of three millions, large numbers of skilled workers were evacuated with their plant while rly. communications were still open. The people who were left settled down, under the inflexible leadership of Zhdanov and Popkov, for one of the grimmest battles of endurance and of will in the history of war. As winter descended—and it was to be one of the hardest on record, with temps. down to 30° C. below zero—the defence lines were stabilised. In the W., the front was only two m. from the centre of the city, and at first the defenders travelled to and fro by tramcar. Four hundred thousand civilians, most of them women and children, dug trenches and threw up fortifications, working three shifts a day. In many parts of the city every house became a fortress.

In the early stages of the battle for Leningrad, bombers were used extensively by the Germans, and a few hits on food depots brought famine much nearer. Later, the use of bombers became uneconomic since artillery could pound the city without any loss. In 1941 and 1942 some 40,000 shells were fired into Leningrad. Many were of light calibre, but they caused immense superficial damage over a wide area. As far as possible, the Russians tried to make good the damage while the siege was still on. In 29 months, total casualties from shellfire were about 20,000, including 5,000 killed. The worst incident was in May, 1942, when a shell landed in a crowd at a tram stop, killing 32. The heaviest day's shelling was in 1943, when 1,564 shells fell in less than 12 hours.

Conditions of City Life

The bombardment, however, was a comparatively minor affliction. In Dec., Jan., and the first half of Feb., famine gripped the people. By Dec. the daily food ration for non-manual workers and dependants was 125 grammes of bread of poor quality—about $\frac{1}{4}$ lb.—and virtually nothing else. Even front line troops received only 350 grammes. Discipline in the city remained good; people died quietly. No official figure of the number of deaths has been given, but after the siege the mayor placed it at "several hundred thousand." Young children died first, then many adults; those over 40 stood the famine best. Dogs and cats were eaten, and some people in

their extremity ate cattle cake, mineral oils, and carpenter's glue. There was some cannibalism. At the height of the siege and the depth of winter, there were houses with a corpse in every room. Courtyards were stacked with frozen corpses. The life of the city for a time came virtually to a standstill. There was little fuel, no electricity, no water system, no transport. People were unable to wash for weeks on end. Drains and sewers were out of action all winter, and it was not until the spring that four hundred thousand weak people went out with spades and shovels to clean up the city and throw mountains of filth into the river.

An Unbroken Spirit

Though they suffered hardships as great as any in history, the spirit of the people of Leningrad was never broken. Apart from the few worst months, many factories kept on turning out war supplies, including the famous Putilov works which, though only two m. from the front, did not cease to manufacture munitions and small arms. Many hospitals functioned normally. Several theatres remained open, with the artists performing in fur coats to fur-clad audiences. The radio kept going, and so did the radio orchestra. Shostakovich's seventh symphony, the Leningrad, written in the besieged city in 1941, was also performed there for the first time during the siege. The Leningrad state library never closed, and every day there were people in its reading room seeking information on many subjects including problems of nutrition. The library even advised on primitive ways of producing fire when matches were unobtainable.

The turning point of the siege came in Feb., 1942, when a road was opened to "the mainland" across the rough ice of Lake Ladoga. Henceforth, streams of lorries travelled the ice road incessantly by day and night under the protection of the Red Navy's air arm. Food was coming in again. Many lorries came to grief as the ice melted, many were bombed. But the road was kept open while the ice lasted, and after the thaw steamers and barges took over the task of maintaining supplies. Half a million living skeletons were safely evacuated over the ice road, and evacuation went on all through the summer of 1942. The decrease in the number of mouths to feed and the increase in supplies made it possible for Leningrad to return slowly to something like a war-

time normality. Amid public rejoicing, the first tram moved along the Nevsky Prospect on April 15, 1942, and it seemed like a symbol of victory.

It was not, however, until mid-Jan., 1943, that Russian troops, taking the offensive S. of Lake Ladoga, succeeded in recapturing Schlüsselberg and forcing a 10-m. gap in the enemy ring. Through this gap, by superhuman exertions, the Russians succeeded in building a railway link with the outside world, laying more than 20 m. of track in 22 days. The link was continually bombed, but it sufficed, and all the efforts of the Germans failed to close the gap. Leningrad was now able to get all essential requirements; the siege was raised.

The blockade was completely lifted a year later. The Russians took the offensive, Jan. 12, from their Oranienbaum bridgehead on the Baltic coast W. of Leningrad and from Volkov to the E. of Schlüsselberg. The two forces met Jan. 18; the end of the blockade was declared on Jan. 27, 1944.

The fact that the city held out against all reasonable expectations was of immense importance to Russian morale, and a major contribution to the defeat of Germany on the eastern front.

Leninsk. Name of several towns of the U.S.S.R. One, in the Kalinin region of the R.S.F.S.R., is about 75 m. N. of Moscow, with which it is connected by rly. Formerly it was known as Taldom Selo.

Another Leninsk, also in the R.S.F.S.R., is on the Truyev river in Saratov region, 110 m. N. of Saratov, on the Penza-Syzran rly. There are tanneries and factories producing leather goods and agricultural implements. Pop. 29,647. A third is in the Stalingrad region, about 30 m. E.S.E. of that city.

Leninsk in Turkmen S.S.R., on the left bank of the Amu Darya, is 65 m. S.W. of Bokhara, and was formerly known as Charjui. Here the Transcaspiian rly. between Merv and Bokhara crosses the river by a bridge over a mile in length. There is an air service between the town and Tashauz.

Leninsk-Kuznetsky. Town of the W. Siberia region, R.S.F.S.R. Situated on the Tom, it is 200 m. S.E. of Tomsk. There are coal, iron ore, and gold mines in the district, and precious stones are found. It is the terminus of a branch of the Trans-Siberian rly. Pop. (1939) 81,980.

Lennox. Name given to a district of Scotland. It consists of Dumbartonshire and part of

Stirlingshire, with smaller portions of Renfrewshire and Perthshire. The Lennox Hills are a range in the district. They extend almost from Dumbarton to Stirling in a N.E. direction and include the Kilpatrick Hills, Campsie Fells, Fintry Hills, etc.

Lennox, EARL AND DUKE OF. Historic Scottish titles. Lennox was made an earldom in the 12th century. Of the early holders perhaps the most noteworthy was the 5th, Malcolm, a companion in misfortune of Robert Bruce, who met his death at Halidon Hill in 1333.

The importance of the title began when it passed by marriage and royal favour to the Stuart family. Duncan, the 8th earl, had no sons, so after his death in 1425 it was secured by his daughter's descendants. One of these married Sir John Stuart of Darnley, known also as the sieur d'Aubigny, and their grandson, the 2nd earl of the Stuart family, was killed at Flodden, while from Matthew, the 4th earl, the British royal family is descended. Matthew married Margaret Douglas, niece of Henry VIII of England, and was regent of Scotland; their son was that Lord Darnley who married Mary Queen of Scots, and was the father of James VI (James I of England). Grandfather and father were killed in quick succession, and for a time the title was merged in those held by the infant king.

In 1580 the earldom was given to Esmé Stuart, a cousin of the king, and, like him, a descendant of its earlier holders. He was made a duke in 1581. Ludovic, the 2nd duke, became in 1623 an English peer as duke of Richmond, but he died the next year, when his brother Esmé, earl of March, became duke of Lennox, but not of Richmond. The two titles were again united in 1641, when Charles I revived the English one for the 4th duke of Lennox, whose family served him devotedly during the Civil War, wherein three of the duke's brothers were killed. When the 6th duke died in Denmark in 1672, the title again became extinct. It was revived, however, by Charles II in 1675 for one of his illegitimate sons, Charles Lennox, duke of Richmond, from whom is descended the family of Gordon-Lennox, the head of which still holds the three dukedoms of Richmond, Gordon, and Lennox.

Lennoxtown. Town in Stirlingshire. It is situated 10 m. N. of Glasgow, and has a rly. station. The main industry is making rails; there is a large institution for men-

tal defectives at Lennox Castle, belonging to Glasgow corporation. The town is at the foot of the Campsie Fells. Pop. 4,500.

Leno, DAN (1860-1904). British comedian, whose real name was George Galvin. Born in Somers



Dan Leno,
British comedian

Town on a spot where St. Pancras stn. now stands, Dec. 20, 1860, he made his first appearance at four as a contortionist. In 1880 he became champion clog-dancer of the North of England. His quaint humour, eccentric dancing, and feverish energy speedily gained him a leading position on the music-hall stage, and in 1888 he was engaged by Sir Augustus Harris to play a "dame" part in the pantomime at Drury Lane, where every succeeding year he was the chief attraction. Periodically he suffered from delusions and had to be restrained. He died Oct. 31, 1904.

Lens (Lat. *lens*, lentil, from its shape). Portion of some transparent refracting substance, such as glass, bounded by two surfaces, one of which is curvilinear and the other plane or curvilinear. Through it rays of light are by refraction caused to converge or diverge regularly. The curvilinear surface is usually spherical. If both surfaces of the lens are spherical, the axis of the lens is the line joining the centres of the spheres; if one surface is plane, the axis is drawn through the centre of the sphere perpendicular to the plane. The point through which the refracted rays pass, or their direction, when the incident rays travel parallel to the axis, is called the principal focus of the lens, and the distance between this point and the lens is called the focal length. A lens has two principal foci, one on each side of the lens, and equidistant from it.

Lenses are of two kinds. Convex, or converging, lenses are those by which a pencil of rays parallel to the axis is refracted so as to pass through the principal focus. Concave, or diverging, lenses are those in which, when a pencil of rays parallel to the axis is refracted, the rays do not pass through the principal focus, but their directions produced pass through a focus. These definitions only hold when the material of the lens is denser than the surrounding medium. If it were less dense, the definitions would be reversed.

Photographic lenses are described as being of so many ins. (or mm.) focal length, which means that virtually parallel light rays reflected from a distant object are brought to focus on a plane the focal length behind the lens. Objects at different distances from a camera cannot be sharply focused simultaneously unless all are so distant (at infinity— ∞) as to be focused at the principal focus, or unless special provision is made, such as the insertion of "stops." The stop or diaphragm is the mechanism which determines the area of the lens to be used, the various apertures being designated by *f* numbers, which are obtained by dividing the effective diam. of the opening into the focal length of the lens. These numbers have a settled ratio one to another and opening the lens one stop, i.e. from *f*11 to *f*8, or from *f*5.6 to *f*4 doubles the amount of light passing through the lens and consequently halves the exposure time necessary. Closing the diaphragm has the reverse effect. Reducing the size of stop increases the depth of focus and, within limits, the resolution of the lens.

Aberrations are faults in the performance of lenses which prevent rays from being brought to a perfect point. No lens is perfect, but by the use of more than one type of glass (various glasses refract light differently) and combining multiple lenses as a single unit a compromise is effected. The simplest form of lens is the meniscus, a single concavo-convex unit which in the cheapest cameras may be a piece of moulded colourless plastic. The edges of such a lens bring the image-forming rays to a shorter focus than the centre (i.e. spherical aberration); consequently it cannot be used at a larger aperture than about *f*16 and cannot be visually focused, as the chemical focus differs from the visual focus. It suffers from chromatic aberration (inability to bring light of different colours to the same point of focus), distortion (reproduction of straight lines in the object as curved lines in the image), and astigmatism (inability to focus sharply both horizontal and vertical lines in the margin of the field).

An improvement is effected if the lens is made from two components (of crown and flint glass respectively) cemented together to form a single unit. Two such units or doublets mounted back to back about a central stop form the symmetrical or rapid rectilinear

(R.R.) lens of a maximum aperture of about $f8$. These lenses are sometimes known as aplanats or achromats. The limits to which they can be corrected are severely restricted and, like the meniscus lens, they should be regarded as obsolete for serious work.

Except for some studio portraiture and other special uses, most lenses are anastigmats in which all the aberrations are partially or entirely corrected and accurate definition is secured all over a flat field. The telephoto lens is a combination, or an ordinary large aperture lens with a negative lens. The latter acts as a magnifier, the degree of enlargement varying with the amount of separation between it and the positive lens. To obtain the same sized rendering of a distant object with one ordinary lens would involve using a camera of clumsy dimensions. The apochromatic lens is one in which light of three colours is brought very accurately to the same focus. It is a lens of small aperture with special uses in colour photography and process engraving.

The angle of a lens determines the amount of the subject included and depends on the ratio between its covering power and its focal length. A normal lens has a focal length equal to a little more than the diagonal of the size of plate or film to be covered, whereas a wide angle lens has a considerably shorter and a narrow angle lens a much longer focal length. The "glass to air" surfaces of lenses are frequently treated with a thin film to reduce surface reflection losses and eliminate ghost images and flair. Such treatment is usually known as blooming. See Concave; Convex; Eyepiece; Microscope; Optics: Photography; Refraction; Telescope. Consult Photographic Optics, A. Cox, 1943; Practical Optics, B. K. Johnson, 1945.

Lens (Lat. *lens*, lentic). A part of the eye (*q.v.*). It receives the rays passing through the cornea and focuses them upon the retina.

Lens. A town of France. In the Pas-de-Calais department, it stands on the Deule, 13 m from Arras, and is a rly. junction and the centre of a coal-mining district. It has engineering works, and its industries include the making of iron, steel, and other manufactures dependent upon coal, for the conveyance of which



Lens arms

there is a canal through the town. Pop. 34,342.

In the Middle Ages, Lens was a fortified place, often the centre of fighting. Here in Aug., 1648, the French defeated the Spaniards. The First Great War brought almost constant fighting around the town, and great damage was done to its buildings and industries, which came to a complete standstill. It was occupied by the Germans from Oct., 1914, to Oct., 1918.

A battle officially styled the battle of Lens was fought between the British and the Germans, May-Aug., 1917, when the former initiated various attacks with the object of forcing the occupying forces from the town. The capture of the Messines ridge in June enabled the British to increase the pressure on Lens. On June 28 a powerful British demonstration was carried out on a front of 12 m either side of Lens; and early in July, British and Canadian troops were in the N., N.W., and S.W. suburbs of the town. But progress was extremely difficult, as the Germans had flooded the low ground and had so connected the cellars of houses by tunnels that each building had to be fought for. In Aug. the British decided to attempt the capture of Lens with three divisions of the Canadian corps. The attack opened on Aug. 15 after preliminary heavy bombardment of the German positions with H.E. and gas. But German counter-attacks were keen and determined, and there was little change in position after a week of bitter fighting. A final assault on Lens in October was then planned; but heavy British losses in the Ypres offensive compelled the abandonment of this. The Canadians were withdrawn and the Germans left in a salient under constant bombardment. Not until 1921 were the coal-mines again in production (See Arras; Artois; Vimy Ridge, etc., for other fighting in the locality).

In the Second Great War, Lens, occupied by the Germans at the end of May, 1940, was liberated Sept. 2, 1944, during the rapid advance of the British 2nd army.

Lent. In the Christian year the fast of 40 days immediately preceding Easter. The word is derived from the A.S. *lencien*, spring. The period appears to have varied; according to some authorities it originally lasted 40 hours; its present duration dates from early in the 4th century. Christ lay in the tomb for 40 hours. He fasted

in the wilderness for 40 days; Lent begins on Ash Wednesday (*q.n.*), and does not include Sundays. See Easter; Fasting; Good Friday.

Lenthall, WILLIAM (1591-1662)

English politician. Born at Henley-on-Thames, son of a country gentleman, he was



William Lenthall,
English politician
After S Cooper

educated at S. Alban Hall, Oxford, and became a barrister. In 1640 he entered the house of commons as M.P. for Woodstock, and was chosen by Charles I speaker of the

Long Parliament. He remained speaker until 1656, and on that his fame rests. He was in the chair when Charles attempted to arrest the five members and on other stirring occasions; also right through the Civil War while the commons were directing its operations. After the virtual deposition of the king, he was something like the president of a republic and to him Cromwell's letters and other official documents were addressed. He sat in Cromwell's house of peers, and returned to his post as speaker when the Rump Parliament was recalled. Though he favoured the Restoration, he was at first excluded from pardon when Charles II returned. He died Sept. 3, 1662, at Burford.

Lentibulariaceae. Small family of herbs. Chiefly natives of temperate and cold regions, they inhabit fresh water, marshes, and bogs. The leaves vary greatly between the oval, undivided thick ones of *Pinguicula* (butterwort) and those of *Utricularia* (bladderwort), which are minutely broken into thread-like segments. The flowers are irregular and showy. There are only six genera, the two already mentioned and *Gentlisea*, *Biovularia*, *Saccolaria*, and *Polypompholyx*. All the species of this family are insectivorous. See Bladderwort, Butterwort.

Lenticel. A patch of loosely fitting cells occurring at intervals in the cork which forms the surfaces of most woody stems and roots. Lenticels are readily visible as spots on most twigs a few years old. They may grow as the twig thickens and form conspicuous streaks running round the branch (*e.g.* silver birch), or may become inobvious among irregularities in bark. The tissue of the lenticel facilitates the passage of gases

into and out of the stem or root. It is formed by the same cambium which for the most part produces the close-fitting cork cells that prevent undue loss of moisture.

Lenticular. Adjective, meaning lens- or lentil-shaped, applied to clouds, mostly at medium height, in which the individual cloudlets are fused into groups the general shape of which resembles the cross-section of a lens. Such clouds have well-defined edges, are smooth, and often suggestive of an airship. They may be associated with föhn (*q.v.*) winds. See Cloud.

Lentigo. Development of pigmented spots following exposure to sun. See Freckles.

Lentil (*Lens esculenta*). Annual herb of the family Leguminosae. It is a native of the Mediterranean region, and much resembles vetch. The leaf is broken up into five or six pairs of oblong leaflets, the midrib ending in a tendril by means of which it clings to other plants. The small, pea-like flowers are pale blue, and are succeeded by short, broad pods containing one or two of the biconvex round seeds which form an important article of food, particularly in the East. Lentil has been cultivated from remote times. The seeds are one of the most nutritious of all foods, and contain water, 8.4 p.c.; protein, 25.7; fat, 1; carbohydrates, 59.2; and ash, 5.7 p.c.

Lentini (anc. Leontini). Town of Sicily, in the prov. of Syracuse. It stands 18 m. by rly. S.S.W. of Catania, on an eminence near the shore of Lake Lentini, the largest sheet of water in Sicily. The chief manufacture is pottery, and there is trade in wine, corn, and cattle. The lake teems with fish, and in the winter is the haunt of myriads of water-fowl. Founded about 730 B.C. by Greek colonists from Naxos, Lentini fell to the Romans in 214 B.C., and to the Saracens in 848. It was destroyed by earthquake in 1698.

Lent Races. Bumping races for boats held at Cambridge university in the term preceding Easter. They take place over four consecutive afternoons; and each college usually puts several crews on the river. They differ from the races in May Week and resemble the Torpids at Oxford in that men of certain attainments in rowing are debarred from taking part.

Lentulus, **PUBLIUS CORNELIUS**, surnamed Sura (d. 63 B.C.). Member of one of the proudest patrician families in ancient Rome, notorious for his profligate life. Charged by Sulla with the misappropriation

of public moneys received while quaestor in Gaul, he impudently thrust out the calf of his leg (*sura*), like a boy expecting punishment for a mistake in a game of ball. He was consul in 71, but in 70 was expelled from the senate for scandalous immorality. Having joined Catiline in his conspiracy against the republic in 63, he carried on negotiations with the envoys of the Allobroges, then at Rome on a mission, who afterwards sold their information to Cicero. When the conspiracy was discovered, Lentulus, who had been left in charge



Lentil. Leaves and seed pods

in Rome, was arrested with his accomplices by Cicero and put to death. See Catiline.

Lenz's Law. In electricity, a law of electric currents discovered by H. F. E. Lenz (1804-65). The law states that if a constant current flows in a primary circuit, and if by the motion of the latter a secondary current is created in a neighbouring circuit, the direction of the secondary current is opposed to the relative motion of the two circuits. See Current; Electricity.

Leo. One of the constellations. It is the fifth sign of the Zodiac. The sun enters the constellation in the last part of July. It contains a number of notable stars, *e.g.* α Leonis or Regulus, a first-magnitude blue star; β Leonis or Denebola, a white star; Algieba, a famous double star; and several nebulae. Regulus, called by the Arabs the kingly star, was one of the four royal stars of ancient Persia. See Constellation.

Leo. Name of 13 popes of whom the more important are noticed separately. Leo IV, pope 847-55, was a Roman, who fortified the city against the Saracens. He built at Rome the suburb called after him the Leonine city and restored a number of churches which the Saracens had injured. Leo V was

pope for a few weeks in 903 and Leo VI for a few months in 928. The seventh, who reigned 936-39, was the nominee of Alberic, the chief power in Rome. He refused to allow the baptizing of Jews by force in Germany. Leo XI belonged to the Medici family, and had been archbishop of Florence for over 30 years before his election to the papacy at the age of 70. He reigned 27 days, dying April 27, 1605.

Leo I (d. 461). Pope, 440-61. He was by tradition a native of Tuscany, and was known as Leo the Great. He was elected pope in succession to Sixtus III in 440, while absent on a mission to Gaul, whither he had been sent by the emperor Valentinian III. The pope's chief care was the promotion of the unity of the church by the extirpation of heresies, and by the maintenance of the papal supremacy over the whole church.

He proceeded to deal first with Pelagianism, then prevalent in Aquileia, and subsequently with Manichaeism, which, driven from Africa by the Vandals, had succeeded in establishing a stronghold in Rome itself, his measures being seconded by an edict of the emperor in 445, which imposed severe penalties on the adherents of this religion. In Spain, by Leo's direction, synods were held, 447-48, for the purpose of putting an end to Priscillianism, a mixture of Christianity, Gnosticism, and Manichaeism. He brought the Gallican episcopate into closer relation with Rome, and made his authority felt in Thessalonica and E. Illyria, then part of the eastern empire.

He originated the system of directing the affairs of all parts of the Church by letters and decrees. His widespread influence culminated in turning back the Hun king Attila and his hordes in their march on Rome, and in saving Rome from sack and the inhabitants from slaughter at the capture of the city by the Vandals under Genseric in 455. Leo died in Rome Nov. 10, 461. Acknowledged as a saint, he has a festival on April 11 in the Latin Church, and on Feb. 18 in the Eastern. Consult Leo the Great, C. Gore, 1880.

Leo II (d. 683). Pope, 682-83, a Sicilian by birth. A year and seven months elapsed between his election and consecration. This was probably due to negotiations pending with the Byzantine emperor, about the tax usually paid to the imperial treasury by popes on their consecration. Leo confirmed the decrees of the sixth general council at Constantinople in 681,



Leo. Principal popes of the name. Left to right: Leo I, 440-61; Leo II, 682-83; Leo III, 795-816; Leo IX, 1049-54; Leo XII, 1823-29; Leo XIII, 1878-1903

which condemned the Monothelites and a predecessor, Pope Honorius I, for heresy. He also enforced his authority over the archbishops of Ravenna. Leo II died on June 28, 683, and is commemorated as a saint in the Roman Catholic Church on that date. *See* Lives of the Popes, H. K. Mann, 1902-10.

Leo III (d. 816). Pope, 795-816. A Roman and a cardinal, he was elected pope in 795. In 799 he was attacked by his enemies, who, to unfit him for his office, endeavoured to tear out his eyes and tongue. He escaped from Rome, to take refuge with Charlemagne, the Frankish king, by whom he was sent safely back to Rome. The main feature of Leo's pontificate was henceforth his close alliance with Charlemagne, on whose head on Christmas Day, 800, in S. Peter's, the pope solemnly placed the imperial crown. The acts subsequently performed in concert by pope and emperor were the outcome of that coronation. In his relation to the East, Leo upheld the monks who had refused to countenance the second marriage of the emperor, Constantine VI, after the divorce of his first wife. He died, June 12, 816, at Rome, and was canonised in 1673. *See* Lives of the Popes, H. K. Mann, 1902-10.

Leo VIII (d. 965). Pope, 964-65. He was the layman whose illegal election and subsequent enthronement as Leo VIII followed the deposition (Dec. 4, 963) of John XII, whom a synod of German and Italian bishops, with the connivance of the emperor, Otto I, had deposed. A counter revolt, which broke out against the emperor and drove out Leo the following February, brought back John, who then excommunicated Leo and all his supporters. On the death of John in May, 964, the Romans elected Benedict V as pope. The emperor at once hurried to Rome, accompanied by Leo. The removal, degradation, and abdication of Benedict followed, and Leo was restored, his true pontificate dating from July, 964, until his death in March, 965.

Leo IX (1002-54). Pope, 1049-54. Born near Colmar, June 21, 1002, he came of a noble German

family named Bruno, and at an early age was chaplain to the emperor Conrad. He was bishop of Toul, 1027-48, and in Dec., 1048, was elected pope on the nomination of the emperor Henry III, and consecrated early in 1049. Assisted by Hildebrand (who as Gregory VII was to hold the papacy), he made several reforms in the discipline of the Church, but his military efforts to relieve the people of S. Italy from Norman oppression ended in defeat at the battle of Civitate, 1053. His efforts to keep the patriarchate of Constantinople subordinate to Rome were also defeated, and the Eastern Church formally separated from Rome a few days after his death, April 19, 1054.

Leo X (1475-1521). Pope, 1513-21. Born at Florence, Dec. 11, 1475, he belonged to the Medici family, and was the second son of Lorenzo the Magnificent. He was early enriched with benefices, and at the age of 13 was made a cardinal. He fled from Florence on the expulsion of the Medici, 1494, and in 1500 settled in Rome.

On the death of Julius II, 1513, he was elected pope, and at once proceeded to spend the revenues of the papacy on art, letters, and music. He patronised Raphael and other artists, encouraged humanism and Italian literature, and reformed the university of Rome. Under him the Roman Renaissance reached its highest splendour. The greed of the papal court, and the entire neglect of all attempts at reform by the pope, were largely responsible for the Lutheran movement in Germany. Leo's foreign policy was marked by complete vacillation. He alternately allied himself with France and the emperor, and in neither case kept faith. His long war with the dukes of Urbino, though it ended in the Medici obtaining the duchy, emptied the papal treasury. A conspiracy of five cardinals to poison the pope was discovered in 1517, and the ringleader, Cardinal Petrucci, was executed. Though worldly and easy-going, Leo was free from the worst vices of his age. He died Dec. 1, 1521. *See* Life, W. Roscoe, 1883; The Medici Popes, H. M. Vaughan, 1908.

Leo XII (1760-1829). Pope, 1823-29. Born near Spoleto, Aug. 22, 1760, he belonged to the Della Genga family. He studied at Rome, was ordained priest 1783, and in 1794 was archbishop and papal nuncio at Cologne. From 1808-20 he lived in retirement at the abbey of Monticelli, and then after being made cardinal, 1817, was appointed to various offices in Rome. On the death of Pius VII, 1823, Della Genga became pope. He was entirely out of sympathy with all liberal movements, and the misgovernment of the papal states under his rule provoked popular risings. In Rome he ordered the Jews to be again confined to their ghettos, and condemned the Freemasons and other secret societies. He died in Rome, Feb. 10, 1829. *See* History of the Papacy in 19th century, F. Nielson, 1906.

Leo XIII (1810-1903). Pope, 1878-1903. Born at Carpineto, March 2, 1810, he belonged to the old Italian family of the Pecci. He studied theology and law in Rome, and in 1837 was ordained priest. From 1837-40 he was civil governor of Benevento in Naples, from 1840-43 of Perugia, and from 1843-46 nuncio at Brussels. From 1846-78 he was archbishop of Perugia, and on the death of Pius IX was elected pope. His pontificate was remarkable for the good relations maintained with France, and established with Germany, and for concordats with other governments. In Italy, Leo continued the protest against the occupation of Rome by the monarchy, and prohibited Catholics from engaging in politics—the latter policy being reversed by Pope Pius X. He made J. H. Newman a cardinal in 1879, and issued a brief, 1896, declaring Anglican orders invalid. Of his many encyclicals the most important was the *Rerum Novarum*, 1891, on the Christian principles of capital and labour. He died in Rome, July 20, 1903. *See* Lives, W. Meynell, 1887; J. MacCarthy, 1896; L. XIII and the Anglican Orders, Viscount Halifax, 1912.

Leo. Name of six East Roman emperors, of whom the more important are mentioned separately. Leo II succeeded his grandfather, Leo I, as an infant in 474, but died a few months later. Leo IV, son of Constantine V, succeeded him in 775, and died in 780. His wife was the famous Irene (*q.v.*). Leo V, surnamed the Armenian, a commander in the army of Michael I, rose against him and deposed him in 813. As emperor, he defeated the Bulgars, but made enemies by his measures against the Paulicians and image-worshippers, and was murdered, Dec. 24, 820. Leo VI, surnamed the Philosopher, reigned 886-911, completed the digest of Justinian's code, and composed orations and poems. His work called *Tactica*, or the Art of War, which was translated into most European languages, is attributed by some to Leo III.

Leo I. East Roman emperor, 457-474, surnamed the Great. A Thracian by birth, he was raised to the throne by Aspar, the Alan commander of the troops in the east, who as an Arian could not hope to secure it for himself. On the strength of his services Aspar obtained great influence over Leo, who, tiring of a subordinate position, dismissed him and afterwards put him and his sons to death as traitors. Leo's troops under Anthemius gained some successes over the Huns, but an expedition against the Vandals on a large scale failed. His reign was otherwise uneventful, and he had little claim to the title of Great.

Leo III. (c. 680-741). East Roman emperor, ruled 717-741, surnamed the Isaurian. Born in Syria, he was the founder of the Syrian or Isaurian dynasty. Commander of the military district of Anatolikon, he ascended the throne at a time when the Arabs were sweeping westward. Soon after his accession they were before Constantinople, but his skilful leadership, the terrible effect of Greek fire, and a severe winter forced them to raise the siege. The menace of invasion was finally removed by the decisive victory at Acroinon in 740. Leo published an abstract in Greek of the Justinian code, improved the lot of the peasants, reorganized the army, and put the civil and military administration of the provinces under the control of one man. In 726 he issued an edict forbidding the worship of images. This created great excitement both in the West and in Constantinople, where attempts at resistance on the part of the

masses incited by the monks were put down with merciless severity, and the quarrel thus provoked lasted a hundred years.

Leo Africanus (c. 1494-1552) OR JOHANNES LEO. Berber traveller and geographer. Little is known of his personal history, but he travelled in the Barbary states. In 1513-15 he began the journeys across the Sudan and Sahara which made him famous. In 1520 he was captured by pirates while returning from Egypt, and sent as a slave to Leo X. Becoming a Christian, and learning Italian and Latin, he wrote his *Description of Africa*, 1526, embodying an account of his travels. He wrote lives of Arab physicians and philosophers; a Spanish-Arabic dictionary; and poems. One of the earliest explorers of the negro kingdoms of N. and Central Africa, he provided for many years the only source of information about them. He died probably at Tunis.

Leobschütz (Pol. Glubczyce). Town of Upper Silesia, under Polish rule from 1945. It lies on the Zinna, 19 m. N.W. of Ratibor, and made, up to 1939, machinery, textiles, glass, bricks, and beer. Pop. 13,300.

Leochares. Athenian sculptor of the school of Scopas. He flourished in the 4th century B.C. Pausanias, Pliny, and other ancient authors cite statues by his hand. His masterpiece was the Rape of Ganymede, of which reproductions are preserved at the library of S. Mark's, Venice, and the Clementine Museum, Rome. He was the sculptor of the Chryselephantine statues of Philip and Alexander of Macedon, Amyntas, etc., made for the Philippeum at Olympia. The Apollo Belvedere is assigned by some to Leochares.

Leominster. Mun. borough of Herefordshire, England. It stands on the Lugg, where two other streams join it, 12 m. N. of Hereford, on rlys. to Presteign, Worcester, and Shrewsbury. The chief building is the church of SS. Peter and Paul; much of it has

been restored, but the Norman nave remains. It was at one time the priory church. There is a beautiful Butter Cross dating from 1633, a modern town hall, and some timbered houses. The cross now stands in The Grange, a



Leominster, Herefordshire. Parish church of SS. Peter and Paul, formerly belonging to a Benedictine Priory
Frith

recreation ground. The town has a trade in hops, cider, and cattle and agricultural produce generally.

Leominster grew up around a monastery, or priory, founded there by a Mercian king in the 7th century. It had a castle, and was one of the places fortified against the Welsh. It sent members to parliament from 1295 until 1885, and was granted several fairs and markets. A centre of the wool trade, it had several merchant guilds, but that industry died out early in the 19th cent. It gives its name to one of the co.'s two parl. constituencies. Market day, Fri. Pop. 5,700. *Pron.* Lemster.

Leon. One of the old kingdoms of Spain. It originated during the years when the country was retaken from the Moors. The strip of land in the mountainous north, held by the Christians and known as Asturias, was gradually enlarged by force of arms until it reached the plain and included within it the city of Leon. About 900 Garcia, one of its rulers, made Leon his capital and the whole land was soon called by that name. Of the early kings, whose main occupation was fighting the Moors, the most noted was Alphonso V, who gave his people a code of laws soon after 1000.

Later, when the king of León was killed while fighting the king of Castile, Leon passed under the rule of Ferdinand, king of Castile, who had married a daughter of Alphonso V. He regarded himself as emperor or overlord of Spain. On his death, in 1065, Leon became again a separate kingdom, but this did not last long. In 1157, however, there was another division and separated again from Castile, Leon



Leominster arm.

reappeared, its king being Ferdinand, a son of Alphonso VII. He was followed by another Alphonso, who married a princess of Castile, Berengaria, a union forbidden by the pope, who placed Leon under an interdict. Ferdinand, the son of Alphonso and Berengaria, having succeeded his mother in Castile in 1217 and his father in Leon thirteen years after, united the two crowns finally, and the kingdoms of Castile and Leon developed into the kingdom of Spain. Leon is now covered by the provinces of Salamanca, Leon, Zamora, Palencia, and Valladolid. It had an area of about 20,000 sq. m.

Leon. Province of N.W. Spain. It is bounded on the N. by the Cantabrian Mts., and contains in the W. the mts. of Leon and the Sierra de Gata in the S., forming the basin of the upper Esla river. It is wooded in the highlands and fertile in the valleys. Coal and iron are worked. Agriculture is the chief industry, and all kinds of cereals are grown, together with fruit; much wine is made, cattle and mules are reared, and leather is manufactured. Leon is sparsely peopled, and has no towns of great importance. Area, 5,937 sq. m. Pop. 524,000. With the provs. of Zamora, Palencia, Valladolid, and Salamanca, Leon constituted a medieval kingdom, founded by Ordoño, 913. United with Castile in 1037, it was separated in 1157, to be reunited in 1230. The modern province dates from 1833.

Leon. City of Spain, the capital of the prov. of Leon. It stands on a mountain slope at an alt. of 2,730 ft., at the junction of the Torio with the Bernesga, 174 m. directly N.W. of Madrid on the Oviedo railway. The old city has well-preserved walls built on the original Roman foundations, and pierced by several gates; a Gothic cathedral, founded 1199; a collegiate church of San Isidoro, consecrated in the 12th century; the magnificent Renaissance monastery and church of San Marcos; and other medieval and provincial buildings. The modern town, in the W., manufactures machines, chemicals, and leather. The headquarters of the Roman 7th legion, Leon was taken by the Goth Leovigild about 540; it capitulated to the Moors in 717, but was retaken about 742. Early in the 10th cent. it became the capital of the kingdom of Leon. Pop. 22,257.

Leon or Leon de los Aldamas. City of Mexico, in the state of Guanajuato. Situated at an alt. of 5,860 ft., it is 31 m. W. of Guana-

junto city, and is served by the Mexican Central rly. It lies in a rich agricultural region, trades in wheat and other cereals, and manufactures woollen and cotton goods, hats, shawls, blankets, leather goods, and pottery. It has a fine cathedral and a municipal palace.

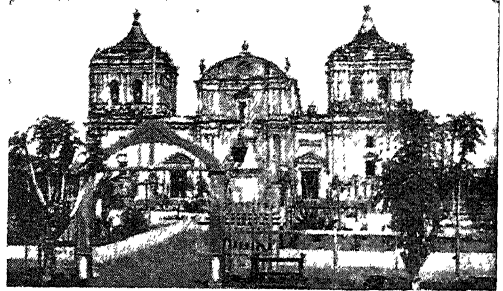
Founded 1576, about 25 years after the first settlement, Leon became a city in 1836. Pop. 74,283.

Leon. City of Nicaragua, and former capital of the country. It stands in a plain between the Pacific coast and Lake Managua, and is connected by rly. with Corinto on the Pacific, 32 m. W.N.W., and with Sauce in the mts. The town contains some of the finest buildings in Central America, including a cathedral, episcopal palace, university, college, and hospital, and is the third largest in the republic. Originally founded in 1523, it was rebuilt on its present site in 1610. A brisk trade is carried on in agricultural produce, timber, and minerals. The city is subject to earthquakes. Pop. 48,861.



Leon, Spain. West front of the cathedral, built about 1250 by Ferdinand III.

Leonardi, GIOVANNI (1543-1609). Italian priest, founder of the clerks regular of the Mother of God. A native of Lucca, he became a chemist's assistant, and was ordained priest at 30. He exercised his ministry chiefly in visiting prisons and hospitals, attracted many followers, and in 1583 obtained approval from Gregory XIII of his congregation of secular priests with simple vows. Not until 1621 did this body receive its present name or take



Leon, Nicaragua. Western façade of the cathedral

solemn vows. Clement VIII appointed Leonardi to superintend the reform of the monks of Vallombrosa and Monte Vergine. He died of pestilence, Oct. 9, 1609, was beatified in 1861, and canonised in 1938, as a model to be imitated in the zeal he showed for propagation of the faith.

Leonardo, FIBONACCI. Italian mathematician of the 13th century. Generally known as Leonardo of Pisa, from his birthplace, he is a shadowy figure. He undoubtedly made journeys along the Barbary coast, in Egypt, Syria, Greece, and Sicily where he studied mathematics and science. He is famous for his *Liber Abaci*, published 1202, and his *De Practica Geometriae*, 1220. The former is remarkable for its problems on numbers, the solution of equations of the first and second degree and indeterminate equations, and the latter a treatise on trigonometry.

Leonardo da Vinci (1452-1519). Italian painter, sculptor, poet, composer, scientist, and philosopher, one of the outstanding creative geniuses of human history. Born in the little village of Vinci in the hills above the Arno, he was the natural son of a notary of the place and of his mistress Caterina. Early acknowledged by his father, the boy was renowned for his personal beauty in youth, and for his prodigious strength. He was early writing sonnets and music, while he steeped himself in science. Apprenticed to the sculptor-



Leonardo da Vinci. Italian painter and sculptor
Self-portrait; Uffizi Gallery, Florence

painter Verrochio at eighteen, with Botticelli and Perugino for fellow-students, he developed rapidly.

About his thirtieth year the restless spirit of Leonardo turned towards the most magnificent court in the north, and he entered the service of Ludovico Sforza, duke of Milan. At Milan he made his home for about seventeen of the best years of his life. The vast range of his work and the power of his intellect are almost incredible. Into every activity of the human understanding, so far as then developed, he flung himself as into battle, and widened the domain of each. He advanced Florentine painting by adding to the capacity of expression the power to give the depth of atmosphere in which the object is held, so that objects appear "in the round," looming into light out of the shadows, the figures not divorced from the landscapes, but a part of the whole. At thirty-five he was working on his great equestrian statue of Francesco Sforza, destined to be set up only in plaster. He painted the world-famous Last Supper, on the wall of S. Maria delle Grazie, Milan.

The fine cartoon for his Virgin and Child with S. Anne and S. John, in the Diploma Gallery at Burlington House, London, was the last work of Leonardo's hands in Milan, for the Sforza had to flee from the city on the entry of the French king, Louis XII. Leonardo withdrew to Mantua, where he made a chalk drawing of Isabella d'Este, now in the Louvre. Thence he went by way of Venice to Florence at Easter, 1500. His second Virgin and Child with S. Anne is in the Louvre, as is his famous Mona Lisa, the portrait of the third wife of Francesco del Giocondo, hence

its other name La Gioconda, the haunting smile of this wilful, weak woman revealing Leonardo's sphinx-like trick with the mouth which persists in nearly all his work. At the age of 54 he was back at Milan, now in the service of the French king. In 1516 the ageing genius was persuaded to go to France by Francis I, with a princely income, and was treated like a prince. We have his portrait of himself in old age. He was never to see Italy again. On May 2, 1519, he died at Cloux, near Amboise.

Leonardo's genius was colossal. His eulogy of himself, which he indited to the duke of Milan as his own recommendation, would sound insane in its egotism were it not that by deeds he surpassed his promise. His fiercely inquisitive and energetic mind lent itself to every problem, but the moment that he had mastered it he cast it aside and looked for new worlds to conquer. In consequence he was in constant trouble for not finishing his pictures—he dawdled for years over the Mona Lisa. The main problem solved, he jauntily left the hack-work to pupils or cast it wholly aside. The fates wrecked his works. The French soldiery of Louis XII practised their weapons



Leonardo da Vinci. Mona Lisa, or La Gioconda, the portrait famous for its inscrutable smile
Louvre, Paris

on his great equestrian statue in Milan; the monks cut a door through the Last Supper; later, Napoleon's troopers stabled their horses in the hall, where its splendour decorated the wall; and exposure to damp after the building was bombed during the Second Great War hastened the deterioration. The S. Jerome in the Desert was found, part as a box-lid in a

shop in Rome, part in a shoe-maker's shop; the Mona Lisa, but a ghost of what contemporary writers describe as regards colour, has suffered restorations which have divorced the figure from the landscape.

Embarrassing his teachers in childhood by profound mathematics beyond their solving, he invented watermills, engines of war, a paddlewheel for boats, breech-loading cannon, the swimming belt, the smoke stack, the mincing machine, and the conical rifle-bullet. He inquired into the composition of explosives, steam as a motive power in navigation, magnetic attraction, the use of a stone-saw, and the circulation of the blood. He was an architect and an engineer, planning the tunnelling of mountains and the connecting of rivers by canals. He forestalled Copernicus's theory of the movement of the earth and Lamarck's classification of animals into vertebrate and invertebrate; he discovered laws of optics, gravitation, friction, heat, and light. He gave much time to the problem of flying. His philosophy anticipates much modern thought—he declares will to be the energy of life.

Bibliography. Leonardo da Vinci, the Anatomist, J. P. McMurrick, 1930; L. da V., C. Bax, 1932; The Romance of L. da V., D. Merejkowski, 1934; L. da V., the Artist, E. McAndy, 1936; L. da V., his Devpt. as an Artist, K. Clark, 1939; L. da V., A. Vallentin, 1939; The Drawings of L. da V., ed. A. E. Popham, 1946. Leonardo is also the subject of a novel, The Forerunner, by D. Merejkowski.

Leoncavallo, RUGGERO (1858–1919). An Italian composer. Born March 8, 1858, at Naples, he studied at the Conservatoire there. His first work, Tommaso Chatertton, was not very successful, but after some years of struggle and disappointment, partly spent in teaching, he suddenly leapt into fame in 1892 on the production of his opera I Pagliacci (q.v.) at Milan. None of his subsequent operas achieved equal success; I Medici was intended as the first part of a trilogy on Italian history, to be called Crepusculum, but this was never finished. He died at Montecatini, Aug. 9, 1919.

Leone, MONTE. A peak of the Lepontine Alps (q.v.). It is situated on the Italo-Swiss border at an alt. of 11,676 ft. The N.E. slope is pierced by the Simplon rly. tunnel, and the ascent can be made from Simplen. The Simplon road curves round the mt. between it and the Fletschhorn.

Leonidas. King of Sparta, 491-480 B.C., the defender of the pass of Thermopylae (*q.v.*). When



Leonidas,
King of Sparta
From a bust

Greece was invaded by Xerxes in 480 Leonidas was sent to defend this pass; in addition to 300 Spartans, he had a composite force from other states, but many deserted him, and at a crucial moment he probably had no more than 1,000 men to oppose a practically unlimited force of Persians. A means of reaching the heroic defenders in the rear was divulged to the Persians by a traitor named Ephialtes. Becoming aware of the betrayal, Leonidas determined that his men should sell their lives dearly, and continued the fight until the last man had been killed. This heroism was a great inspiration to the Greeks.

Leonids. Swarm of meteors, so called because they apparently radiate from a point in the constellation of Leo (*q.v.*). The first record of this meteor shower is in 902, when it occurred on Oct. 20. The maximum now occurs about Nov. 16. On Nov. 12, 1833, there was a remarkable display. John Couch Adams later demonstrated that the shower was due to an immense swarm or band of meteors travelling in an elliptic orbit round the sun in a period of 33½ years. Schiaparelli showed that Tempel's comet moved in the same path. For two years after 1866 the earth still seemed to be in the thick portion of the band, but after that conspicuous showers ceased. It was hoped they would repeat themselves in 1899, when theoretically the thick part of the band would again cut the earth's orbit. But neither in 1899 nor in 1932 was there any unusual display of the Leonid swarm. The orbit of the meteors has undoubtedly been so far perturbed by the attraction of Saturn and Jupiter that the main stream now passes nearly clear of the earth's orbit. *See* Meteors.

Leonine Verse. Term used to denote a Latin verse, the end of which rhymes with the syllable or syllables preceding the caesura, as in the medieval lines:

*Cervisiae sperno potum, piacente Falerno,
Sed tamen hanc quaero, deficiente mero,*

which have been rendered:

*Ale I decline when offered wine,
But if wine fail I order ale*

The origin of the name is unknown. Leonine verse-writing became common among medieval Latinists. The most famous example is the *De Contemptu Mundi* of Bernard of Cluny of the 12th century, Eng. trans. J. M. Neale, new ed. 1877. *See* Poetry; Verse.

Leonnatus (d. c. 322 B.C.). One of the chief officers of Alexander the Great, whose life he helped to save in India in 327. He was rewarded for this and other services by the gift of a golden crown, and after Alexander's death was made governor of Lower Phrygia. He fell in battle while assisting the regent Antipater against the Greeks.

Leonora. Name of three separate overtures written by Beethoven for his opera *Fidelio* (*q.v.*).

León Pinelo, ANTONIO DE (d. 1660). Spanish author. Born at Córdoba, Argentina, he studied law at Lima, but spent most of his life in Spain, where he was prominent in the administration of the colonies. Before leaving S. America he had examined the archives of Peru and Mexico, and in 1629 he produced his *Epitome de la biblioteca oriental y occidental, náutica y geográfica*, the earliest bibliography of the Spanish colonies. Another important work was the great colonial code, *Recopilación de las leyes de las Indias*, published in 4 vols. after his death.

Leopard (*Felis pardus*). Large member of the cat genus, distinguished by its size and rosette-like spots. It is smaller than the tiger, which it resembles in ferocity, and is usually about 4 ft. long. Leopards are found in Africa and throughout Asia, the only large

will rarely attack man unless provoked, but is dangerous to children. In India the leopard is commonly called the panther, the name leopard being usually restricted to the cheetah, which belongs to a different genus. The animal is a favourite object for hunters, and its skin is of value for rugs. *See* Animal; Cheetah; Panther.

Leopardi, GIACOMO, COUNT (1798-1837). An Italian poet and scholar. He was born at Recanati,



Giacomo Leopardi

June 29, 1798. A cripple with a spinal complaint, the lad had an insatiable taste for learning and every opportunity for indulging it in his father's library. After prolonged absences in Rome, Milan, Bologna, and other places, he finally left home in 1830 and lived in poverty at Florence and elsewhere. He died at Naples, June 14, 1837.

The dominating note of Leopardi's work, in both poetry and prose, is pessimism, born of his ill-health. A genius of a high order, he wrote but little, and his work is marked by a Greek refinement of beauty and form. His chief poems are canzoni and odes—mostly unrhymed—and his principal prose consists of dialogues, letters, and aphorisms. There are many editions of his poems and several English translations, notably by Sir T. Martin, 1904.

Leopard's-Bane. A popular name for plants of the genus *Doronicum*, of the family Compositae, having about 12 species. Hardy perennials with yellow flowers, one variety is said to be poisonous, and Konrad von Gesner (1516-65), German-Swiss naturalist, is reported to have died after experimenting with it.



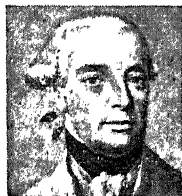
Leopard. 1. Snow leopard, also known as the Ounce, of Central Asia. 2. African leopardess.

Leopold I (1840-1705). German king and Roman emperor. A younger son of the emperor Ferdinand II, he was born June 9, 1640. Educated for the Church, he became heir to the thrones of the Hapsburgs when his elder brother died in 1654. In 1655 he was chosen king of Hungary, and in 1656 king of Bohemia. In 1657 his father died, and he became ruler of a great inheritance. In 1658 he was formally chosen emperor.

Leopold's reign was spanned by that of Louis XIV of France, and his main work was to resist the aggressive policy of that rival, who was also his brother-in-law. Early in his reign he carried on a short war with Sweden, which was followed by one against the Turks. From 1672-78 he was engaged in a war against France, after which he had a few years of peace. In 1683 his land was invaded by the Turks, and he fled from Vienna, which was only saved by the arrival of John Sobieski of Poland. In 1689 he joined the Grand Alliance, and with England, Holland, and other powers waged war against France until 1697. The last of his wars was over the Spanish Succession. Leopold was very anxious to secure this for his second son Charles, and by the partition treaties a good share was assured to that prince. Louis, however, obtained all for his own grandson, and the war was raging when the emperor died.

The emperor had serious troubles in the lands over which he ruled, especially in Hungary. Various changes were made in their administration and in general the tendency of this reign was to accelerate the process of making the Hapsburg lands, and not the Holy Roman Empire, the base of the emperor's power. Leopold was industrious and able: he was, however, very bigoted and had the narrow and autocratic ideas of his house. He died May 5, 1705, leaving two sons, Joseph and Charles, both of whom became emperors. He was married three times.

Leopold II (1747-1792). German king and Roman emperor. Born May 5 1747, he was the third son of the empress Maria Theresa and her husband, Francis I. By arrangement he succeeded his father as grand duke of Tuscany in 1765, and ruled that country from his capital, Florence, for twenty-five years, for the most part excellently



Leopold II,
German king

In 1790, on the death of his brother, Joseph II, he became emperor, but only enjoyed his new dignity for two years, as he died March 1, 1792. He had time to reverse in certain directions the unwise policy of Joseph, to make a treaty of peace with Turkey, to appease the insurgent peoples of the Netherlands and of Hungary, and to negotiate with Prussia and Russia. As the brother of Marie Antoinette, Leopold was closely affected by the outbreak of the French Revolution, but even after the flight to Varennes he trusted that armed intervention would be unnecessary. Leopold married a Spanish princess, and had a large family. The eldest son was the emperor Francis II; others were archdukes notable in the history of the early 19th century, notably Charles, Joseph, and John.

Leopold I (1790-1865). King of the Belgians. A younger son of Francis, duke of Saxe-Coburg-Gotha, he was born at Coburg, Dec. 16, 1790. He served for a time in the Russian army and was present at the great battles against Napoleon in 1814. His intimate connexion with



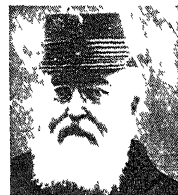
Leopold I,
King of the Belgians
After Lawrence

England began when, in 1816, he married the Princess Charlotte, daughter of George IV, while a little later another marriage in his family made him the uncle of Victoria, the future queen. He was created duke of Kendal, and voted an income of £50,000 a year, and he remained in England after his wife's early death. 1817.

In July 1831, after negotiations, Leopold accepted an invitation to become the first king of the Belgians; in difficult circumstances and in a troubled age he ruled that country wisely and successfully until his death, Dec. 10, 1865. His experience, excellent judgement, and knowledge of men and books made him a very influential figure in Europe, and Queen Victoria was one of many who resorted to him for counsel. His second wife was a daughter of Louis Philippe. By her he had two sons: Leopold, his successor, and Philip, count of Flanders, the father of King Albert. See *Life*, T. Juste, Eng. trans, 1868.

Leopold II (1835-1909). King of the Belgians. Son of King Leopold I, he was born at Brussels, April 9, 1835. In 1846 he was made duke of Brabant and as heir to the

throne soon began to take part in public life, being also an officer in the army and passing some time in travel. In



Leopold II,
King of the Belgians

1865 he became king. He is known as the founder of the Congo Free State, which was his private property and which, by iniquitous means, was made to yield him a large income until 1908, when he handed it over to his country. In Belgium his rule was, on the whole, wise, but the scandals of his private life were notorious. He died at Laeken, near Brussels, Dec. 17, 1909.

The king married in 1853 a Hapsburg princess, Marie, daughter of the archduke Joseph. She died Sept. 19, 1902. They had four children. The only son, Leopold, died in 1869. One daughter, Louise, married Philip, prince of Saxe-Coburg-Gotha, from whom she was divorced in 1906. Another, Stéphanie, married, first the archduke Rudolph, and secondly a Hungarian count, this leading to trouble between her and her father. The third, Clémentine, was married in 1910 to Napoleon, head of the Bonaparte family. After 1902 there was litigation between the king and his two elder daughters over their mother's fortune. See *Congo*, Belgians.

Leopold III (b. 1901). King of the Belgians. Eldest son of King Albert and Queen Elisabeth, he was born Nov. 3, 1901, and educated at Eton. He was with the Belgian army in the field towards the end of the First Great War. Formerly duke of Brabant, he came to the throne Feb. 17, 1934. On Aug. 29, 1939, war with Germany being imminent, he made with Queen Wilhelmina of the Netherlands a joint offer of mediation, which was refused by Hitler. On May 11, 1940, the day after the Germans invaded his country, the king placed himself at the head of the army. He capitulated on May 28, exposing the B.E.F. and French forces to danger. Leopold had informed the allies of his intention on May 27, but all efforts failed to transmit messages to the commanders.



Leopold III,
King of the Belgians

In Nov., 1940, Leopold at his own request visited Hitler at Berchtesgaden. The interview had no obvious results, Leopold continuing to live a semi-prisoner, at Laeken until he was removed to Germany when the Allies landed in France in 1944. He was liberated by the U.S. 7th army at Strobl, near Salzburg, May 8, 1945.

Feeling in Belgium against the king was strong, and he remained abroad, leaving Austria for Switzerland in Oct. Despite pressure, however, he refused to abdicate, maintaining that he was innocent not only of collaboration with the Germans, but also of lack of wisdom in his actions during the war.

For the next five years the political parties in Belgium tried, but failed, to reach a solution of the royal question. A referendum held in March, 1950, gave a vote 57.68 p.c. for the king; but the Socialists, constituting a third of both houses of parliament, had declared they would actively resist the king's return if the vote in favour were less than 66 p.c., and a crisis followed, the govt. resigning, and no politician being able to form another. (See N.V.)

In 1926 he married Princess Astrid of Sweden (1905-1935), who died as the result of an accident near Lucerne, to a motor-car driven by Leopold, who was injured, Aug. 29, 1935. There were three children of this marriage: Josephine (b. 1927), Baudouin, heir to the throne (b. 1930), and Albert (b. 1934). In 1941 Leopold married Marie Lilian Baels, daughter of a banker. She was given the title of princess of Réthy. Her son Alexander was born in 1942.

Leopold (1676-1747). German soldier and prince of Anhalt-Dessau, known as the old Dessauer. Born July 3, 1676, the son of John George, prince of Anhalt-Dessau, he succeeded to the principality in 1693. He entered the service of Prussia, and when the War of the Spanish Succession began commanded a corps, being promoted later to the command of all Prussian forces. Among many engagements in the Netherlands, Germany, and Italy, he was at Höchstädt, Blenheim, Turin, and Malplaquet. In 1715 he led an army against the Swedes, who were driven by him from Rügen, and in the short War of the Polish Succession he served under his old chief, Eugene. In 1740 he took command of an army in the war over Silesia, and in 1745 won a great victory at Kesselsdorf. He

died April 9, 1747. The old Dessauer was one of the creators of the Prussian army, the infantry of which owed much to his training. He married the daughter of an apothecary, and three of their sons won fame as soldiers, especially Maurice (1712-60.)

Leopold II (1797-1870). Grand duke of Tuscany. Son of the grand duke Ferdinand III, he



Leopold II, Grand Duke of Tuscany

was born in Florence, Oct. 3, 1797, and passed some early years in exile. In 1824 Leopold became ruler of Tuscany. In 1848 Leopold granted a constitution to his people, and

entered into a war against Austria, but was driven from the country. He soon returned, but only the aid of Austria enabled him to remain on his throne. In 1859 his refusal to ally himself with Sardinia led to his fall. He fled to Vienna and lived in retirement until his death, Jan. 29, 1870.

Leopold, CARL GUSTAF AF (1756-1829). Swedish poet. Born Nov. 23, 1756, he held librarian's posts at Greifswald, Stralsund, and Uppsala. He was appointed secretary to Gustavus III in 1786, member of the Swedish Academy in 1796, and was ennobled in 1809. He died Nov. 9, 1829. Besides a mass of lyrical poetry, Leopold wrote two five-act dramas in alexandrines—*Odin*, staged in 1790, and *Virginia*, in 1803—and several philosophical and critical works in prose. His collected works, 6 vols., appeared 1814-33.

Leopold, ORDER OF. A Belgian decoration instituted by King Leopold I, in 1832, for award to officers displaying conspicuous gallantry in the field, or to civilians for outstanding services to the state. There are five classes of the order, but in each the badge is identical except for the civilian division. The military badge consists of a gold, white enamelled, Maltese cross resting

upon a green enamelled wreath of oak and laurel. On a central, circular, black ground is the lion rampant of Belgium in gold surrounded by a crimson circle with the motto *L'Union Fait la Force*. The badge is surmounted by a gold crown, at the top of which is a ring through which the ribbon is looped. Awarded to an officer, it has crossed swords. It is suspended from a ribbon of crimson watered silk.

In 1900 an order of Leopold II was instituted with five classes: grand cross, grand officer, commander, officer, and companion. It is awarded for services to the royal house. The badge shows a cross with double points resting on a wreath. In the centre is the lion rampant of Belgium in gold on an enamelled ground surrounded by a blue circle carrying the same motto as the other. Except that for companions, which is silver, the badge is gold. It hangs from a ribbon of saxe blue with a central black stripe.

Leopold II. Lake of the Belgian Congo. It connects the Mfini river with the Kasai river, a tributary of the Congo. Its size is about 75 m. by 30 m. The country is low and marshy.

Leopold Canal. Artificial irrigation channel of Belgium, draining W. into the sea near Zeebrugge, E. near the Netherlands frontier into a small stream which empties into the Braakman, an inlet of the W. Schelde. It formed in 1940 part of the defence system of the city of Bruges, and gave its name to the Leopold Line based on it. In 1944 the Germans in their turn used it as a defence line; the Canadians succeeded in crossing it on October 6, 1944.

Leopoldville. A town in the Belgian Congo, and since 1923 the capital. It is situated immediately below the S.W. extremity of Stanley Pool, not far from Brazzaville, on the opposite side. It is the farthest point reached by steamers navigating down the Congo from Stanleyville; it is also the leading inland port of the colony, and is connected by rly. with the river port of Matadi. There is an air service to Brussels. Leopoldville gives its name to a province. It has a court of appeal. Near is Kinshasa, on Stanley Pool. As the terminus of a pipe-line from Matadi, the town is concerned with crude oil. Pop. approx. 116,000.

Leovigild (d. 586). Visigothic king of Spain. After Athanagild's death, his brothers Leovigild and



Leopold. Badge of the Order of Leopold I

Liuva in 568 divided his kingdom, ruling respectively in Spain and Septimania (Narbonne), Leovigild succeeding to the whole in 573. He wrested some districts in the S. from the Byzantine Empire, 571-72, crushed a revolt instigated by disaffected nobles, and in several campaigns extended his dominions in the N.W. and S.E. of Spain. In 585 the Suevic kingdom in the N.W. was conquered, and Leovigild thus united all Spain except the imperial districts in the S. He died April 21, 586, at Toledo.

Lepanto. Harbour of Greece. Situated on the N. of the Gulf of Corinth, it lies about 12 m. N.E. of Patras. It does a fair amount of general shipping trade, but was formerly of greater importance. In the Middle Ages it was strongly held by Venice, but was taken by the Turks, 1499. The ancient Naupaktos, it is now known as Epaktos, Lepanto being its Italian name. Pop. 4,100. The Gulf of Lepanto, an arm of the Ionian Sea, is better known as the Gulf of Corinth (*q.v.*).

Lepanto, BATTLE OF. Naval engagement fought between the Holy League and the Turks, Oct. 7, 1571. It was the last great naval engagement between oared galleys. Under Don John of Austria, a combined Spanish, Papal, Venetian, and Genoese fleet of 202 vessels attacked a far more numerous Turkish force, estimated at 275 galleys, off the Curzolari islands, and inflicted upon it a signal defeat from which Turkish naval power never recovered. Both fleets were divided into three main bodies. The Turkish centre of 96 ships, under Ali Pasha, was routed after many hours' hard fighting, by the 62 vessels under the immediate orders of Don John, Ali himself being killed. In that part of the fight there was no attempt at manoeuvring, but on both wings the tactical element was prominent. The Turkish right, under Mahomet Seirocco (or Shaluk), endeavoured to outflank the Christian left, under the Venetian Barbarigo, and attack it in the rear; but the attempt failed, and the Turks were driven into a bay and almost annihilated. On the allies' right, Giovanni Andrea Doria, with 53 galleys, was opposed by Uluch Ali (or Ochiali), with 93, and the Genoese admiral succeeded in engrossing his opponent's attention, while at the same time avoiding a close action, which could only have resulted in his destruction. As the issue

in the other parts of the fight declared itself, reinforcements were sent to Doria, with the result that Uluch Ali made good his escape with only 30 vessels. The allies were greatly helped by six enormous galleasses, which threw the Turkish advance into confusion. The Turks are said to have lost 190 galleys captured, 30,000 men killed, 10,000 prisoners, and 12,000 slaves who were freed; the Christians lost 7,500 killed. Cervantes, who lost his left hand, was among the wounded. Chesterton wrote a vivid poem, called *Lepanto*, about the battle.

Lepcha or Rong. Primitive Indian hill-tribe, in Sikkim and the Darjeeling dist. of Bengal. They may total 20,000, and are sturdy, frank, Mongoloid Buddhists, speaking a Tibeto-Burman dialect. Formerly nomadic woodmen, they now practise tillage in the lower valleys.

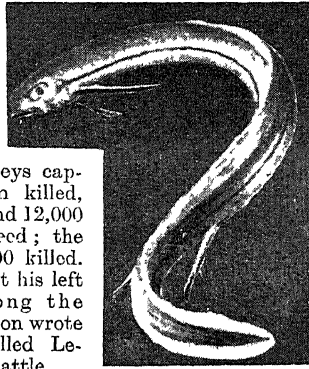
Lepidodendron (Gr. *lepis*, scale; *dendron*, tree). Genus of large fossil tree-like forms. The plant, the ancestor of the present-day club moss, grew to 100 ft. in height in the swampy forests of the Carboniferous age. Their fossil remains are found largely in coal measures, and the plants were one of the chief sources of the vegetation which slowly hardened into coal. *Lepidodendron* fossil remains are first found in Lower Devonian rocks, and became extinct in the Permian period.

Lepidolite. Lithium-bearing mica, constituting an ore mineral of lithium. It occurs in typical mica forms, but is often rose-red or lilac in colour; and is found in granite pegmatite associated with other lithium minerals. *Lepidolite* is the most important lithium mineral for making certain types of glass. See *Lithium Ores*; *Mica*.

Lepidoptera (Gr. *lepis*, scale; *pteron*, wing). Large order comprising the butterflies and moths and numbering about 140,000 species. They range from minute to big insects, which have the wings, and usually the body and appendages, more or less clothed with flattened scales that easily come off as a fine dust when the insects are handled. The mouth-parts are modified into a spirally coiled suctorial proboscis used chiefly for imbibing nectar from flowers; mandibles are rarely

present. The larvae are caterpillars, usually with eight pairs of feet, and the pupae are protected in silken or other cocoons. See *Butterfly*; *Insect*; *Moth*.

Lepidosiren (Gr. *lepis*, scale; *seirên*, siren). Genus of the dipnoi or lung fishes which are able to breathe air by means of a lung, in addition to extracting oxygen from water by gills. There is only one species (*L. paradoxus*), commonly known as the South American lung fish, the lepidosiren, found in the Amazon and its tributaries and



Lepidosiren. South American lung fish

in the Upper Paraguay river, where it feeds upon water snails. It resembles in appearance a very thick eel, and is about 4 ft. long when adult. When the waters dry up in the hot season, it takes refuge in a burrow, and remains dormant till the rainy season. See *Dipnoi*.

Lepidus, MARCUS AEMILIUS (d. 13 B.C.). A Roman general and triumvir. Of wealthy patrician family, on the outbreak of the civil



Marcus Aemilius Lepidus From a bust

war between Pompey and Caesar in 49 B.C., he took the side of Caesar, and was rewarded with the consulate in 46. At the time of Caesar's murder in 44 he was about to take up a provincial government, and his army proved immediately useful to Antony.

In 43 Lepidus joined Antony and Octavian in the first triumvirate, the object of which was the partition of the Roman world among its three members, Gaul and Spain being assigned to Lepidus. The pact was renewed after the battle of Philippi, Lepidus now receiving Africa, but eventually, feeling himself overshadowed by his more powerful colleagues, he tried to conquer Sicily for himself. He was no match, however, for Octavian, who undermined his troops' allegiance, although he spared his life. Lepidus died in retirement at Circiæ. He is not to be confused with his father of the same name, consul in 78, whose

attempt to subvert the republic was defeated by Pompey and Catulus in the Campus Martius.

Le Play, PIERRE GUILLAUME FRÉDÉRIC (1806-82). A French sociologist. Born at La Rivière St. Sauveur, Calvados, April 11, 1806, he studied at the École Polytechnique and state dept. of mines, and became professor of metallurgy at the École des Mines, 1840. He was prominently connected with various world fairs, including the Great Exhibition of 1851. He applied to social studies such factual observation as others gave to the natural sciences, publishing in 1855 *Les Ouvriers Européens* (6 vols.). Next year he founded an international society to work at his basic theory of sociology: that what mattered was treatment of primary occupations and elaboration of the formula "place, work, and folk." He died April 5, 1882.

Lepontine Alps. Central portion of the Alpine system. The mts. trend N.E. from the Simplon Pass to the Splügen, and include the St. Gotthard massif. On their N. slopes lie the sources of the Rhône and the Rhine. To the S. rise the Toce, the Ticino, and other feeders of the Italian lakes. The highest peak is Monte Leone (*q.v.*).

Leprechaun (Irish *luchorpan*, little body). In Irish folklore, small creature generally appearing in the form of a wrinkled old man. They are supposed to be of evil disposition, but by means of spells can be made to work for human beings or to discover hidden treasure.

Leprosy (Gr *lepros*, scaly). Chronic contagious disease, apparently limited to humans. Caused by the bacillus leprae, it is distinguished by characteristic affection of the skin and mucous membranes (nodular type), or of the nerves (anaesthetic type), or of mixed type. The disease has a widespread geographical distribution, occurring mainly in the Far East. The way it spreads is unknown, but intimate contact is essential. The bacillus probably gains entrance through the mucous membranes of nose and pharynx, whence it travels through the body by the lymphatic and subcutaneous tissues. Only a low percentage of those living with lepers develop the disease; isolation is considered unnecessary if careful hygienic precautions are taken. Leprosy is not hereditary.

The incubation period is uncertain, varying from a few weeks to five years. Nodular leprosy is ushered in by rigors, sweating,

diarrhoea, and nose bleeding. A general rash is accompanied by fever, when the bacilli may be found in the bloodstream. This type shows the leonine face, because of the enlarged nose and pendulous cheeks. The nodules will probably break down and suppurate with time, destroying vital tissues. The anaesthetic type begins with neuritis and nervous depression, followed by numbness and failure of sensation. Muscular paralysis and necrosis of small bones often occur.

Diagnosis depends ultimately on finding the specific bacilli in fragments of tissue removed for examination. The outlook for cure is reasonably good. Treatment by the injection of chaulmoogra oil is slow and unpleasant, but effective in the early stages. Of great value is diaminodiphenyl sulphone (D.A.D.P.S.), which is cheaply produced and, since taken by mouth, easily administered.

The Leper in History

Leprosy has been known from time immemorial; it is frequently referred to in Egyptian papyrus and stone records; was prevalent in ancient India and China; is described in the O.T. (Ex. 4; Lev. 13; Num. 12; 2 Kings 7; 2 Chron. 26). In the Middle Ages it became rife in Europe, brought from the East by crusaders, and most governments passed laws in the attempt to prevent the contagion from spreading. Sufferers from the disease were compelled to wear a distinctive yellow dress and to carry a bell or clapper. They were forbidden to enter churches, but might watch the service through a hole in the outer walls known as the leper's squint, a relic surviving in many churches.

Hospitals were set up under the name of lazaret houses, so called after S. Lazarus, the patron saint of lepers. Later still, lepers were segregated in special settlements known as lazarettos. By the 15th century the disease rapidly declined in Europe. In the U.K., where it was made a notifiable disease in 1949, there are a few hundred lepers. In Iceland, Norway, Turkey, and Spain leprosy remains fairly common. It is prevalent along the coasts of Africa, throughout India and China, in Hawaii, S. America, parts of N. America, and is frequently found among the aboriginals of Queensland and the Northern Territory of Australia.

The number of persons in the world suffering from leprosy is about 5,000,000. One of their

largest settlements is on Molokai, in the Sandwich Islands, where Father Damien (*q.v.*) worked 1873-89; it constitutes the county of Kalawao and is under the U.S. board of hospitals and settlements. The British Empire Leprosy Relief Association reckons 2,000,000 sufferers in the empire, half of them in India. In 1947 there was one leper to every 100 people in Burma. In Nigeria there are 400,000, and in some other parts of Africa the incidence of the disease is one in 20.

Lepsius, KARL RICHARD (1810-84). German Egyptologist. Born at Naumburg, Saxony, Dec. 23, 1810,



Karl Lepsius, German Egyptologist

he studied at Leipzig, Göttingen, and Berlin; produced a thesis on palaeography, 1834; and determined the Etruscan alphabet, 1841. During an expedition to Egypt, 1842-45, he examined Meroë, located the Labyrinth (*see* Fayum), and formed a vast collection of drawings and squeezes of mural scenes and inscriptions. Eng. trans. appeared of his *Tour from Thebes to Sinai*, 1846; and *Letters from Egypt, Ethiopia, and Sinai*, 1852-53. Appointed professor in Berlin, 1846, he published his results in 12 folio volumes, with 963 plates, as *Monuments from Egypt and Ethiopia*, 1849-59: supplemented posthumously, 1897-1913. His *Standard Alphabet*, 2nd Eng. ed. 1863, applied Roman letters to 120 unwritten languages. He recovered at Tanis the stèle of Canopus, 1866. He died July 10, 1884.

Leptis Magna. Name of a city of Africa which flourished under the Phoenicians and Romans. Situated 64 m. E. by S. of Tripoli, it is known as Lebda. It was founded by emigrants from Sidon and Tyre, and was for many centuries the chief commercial centre for the routes southward into the Sahara, and rivalled Carthage, to which it became tributary. Leptis Parva, frequently confused with Leptis Magna, is the modern Lamta, near Susa in Tunisia.

Lepton. Greek denominational coin; the one-hundredth part of a drachma. *See* Drachma.

Lepus (Lat., hare). One of the small constellations. Situated near Orion, it was named by Ptolemy. Arneb, the name of its principal star, is Arabic for hare.

Le Puy. Town of France, capital of the dept. of Haute-Loire. It lies 89½ m. by rly. S.W. of Lyons, at an alt. of 2,000 ft. on the slopes of Mt. Anis; the river Dolézon flows through part of Le Puy, to join the Borne. There are extensive lacemaking establishments, other industries being in leather, liqueurs, and chocolate.

The cathedral of Notre Dame is a notable example of Romanesque work, of the 11th and 12th centuries, with a lofty bell tower (c. 1285) and beautiful cloisters. Other churches are those of S. Michel d'Aiguilhe (10th century), on a high rock, and S. Laurent. On the top of the steep Rocher de Corneille, which dominates the town, is a metal statue of Notre Dame de France, 50 ft. high. Le Puy was formerly the capital of the Velay, and in Latin was called Podium (the height); it was a favourite place of pilgrimage in medieval France. Its bishop Ademar was one of the leaders of the first crusade, 1097. Pop. 22,705.

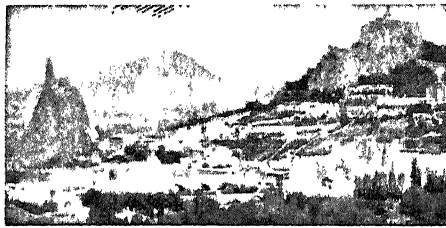
Le Quesnoy. French town, in the dept. of Nord. It lies between the rivers Écaillon and Rhônelle, nine miles S.E. of Valenciennes. Formerly a fortress and still preserving ancient ramparts, it endured many sieges, notably by the Austrians in 1793. During the First Great War it fell early to the Germans, but was stormed by New Zealanders just before the armistice.

Le Queux, WILLIAM TUFNELL (1864-1927). An English novelist, born in London, July 2, 1864. After journalistic training, he came into popularity as a teller of sensational tales of crime and espionage. *Guilty Bonds*, 1891, was followed by *The Eye of Istar*, 1897; *Fatal Fingers*, 1912; *Rasputin*, 1920; *Blackmailed*, 1927. He wrote in 1894 an imaginative forecast, *The Great War in England in 1897*; and, undeterred by the failure of his prophecy, tried again in 1906 with *The Invasion of 1910*. He died Oct. 13, 1927. Consult *The Real Le Queux*, N. S. Sladen, 1938.

Lérída. Prov. of N.E. Spain, in Catalonia. It slopes S. from the Pyrenees, and comprises the basin of the Segre, a tributary of the Ebro. Largely mountainous, it has in the south portion of the prov. extensive plains, the Llanos de Urgel, which owe their productivity to irrigation. Sheep

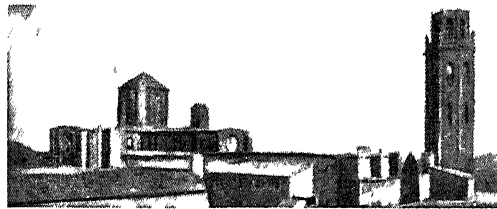
are raised in large numbers. There are many saw and flour mills, distilleries, paper, soap, leather, cotton, and linen factories, with a trade in timber, cattle, mules, horses, sheep, wine, etc. The tiny republic of Andorra is at the N.E. corner. Area 4,656 sq. m. Pop. 288,489.

Lérída. A city of Spain. The capital of the prov. of Lérída, it is the ancient Ilerda. It stands on the Segre river, 114 m. by rly. W. of Barcelona. The ancient city has two cathedrals, one, now utilised as a barracks, founded in 1203, the other in 1759. Among other important edifices are an episcopal palace, a 13th century church,



Le Puy, France. View showing, left, S. Michel d'Aiguilhe; right, the Rocher de Corneille

an old town hall, besides the palace of the kings of Aragon. A stone bridge, built on Roman foundations, spans the Segre. The city has manufactures of textiles, leather, paper, and glass. Founded by the Iberians, the city was captured by Caesar in 49 B.C.; by the Moors in 713 and 797. The latter held it until 1149, when Raymond Berengar IV of Barcelona re-



Lérída, Spain. The old cathedral, built in 1203 and now used as a barracks

covered it. Lérída withstood several sieges in the 17th-18th centuries, but was occupied by the French in 1810. Pop. 46,400.

Lerins, ÎLES DE. Group of small French islands in the Mediterranean Sea off Cannes, in the dept. of Alpes Maritimes. Bazaine and the "man in the iron mask" were imprisoned on Sainte Marguërite, 4½ miles round. Saint Honorat, 2 miles round, has the remains of the 4th century monastery of Lerins.

Lermontov, MIKHAIL YURIÉVITCH (1814-41). Russian poet. He was born in Moscow, Oct. 15,

1814, and belonged to a family of small nobles, traditionally descended from a Scotsman, George Learmonth. Educated at Mos-



Mikhail Lermontov, Russian poet

cow university and the military school at St. Petersburg, he received a commission in the Life Guard Hussars at 19, and shortly after published his earliest works. In 1837, for some outspoken verses on Pushkin's death, he was banished to the Caucasus, in which he found much of his poetic inspiration. The following year he was allowed to return to St. Petersburg, only to be banished again in 1840, and on July 15, 1841, was shot dead in a duel.

In his short life Lermontov won a commanding position in Russian poetry. Some of his most notable poems are *The Demon* (Eng. trans. R. Burness, 1917); *The Song of Kalashnikov* (Eng. trans. E. L. Voynich, 1911); *Duma*; *Valerik*; *Ismail Bey*. He wrote several plays and in 1840 a remarkable novel, *A Hero of Our Times*, regarded as partly autobiographical; Eng. trans. frequently.

Leros. Island in the Aegean Sea, one of the Sporades or Dodecanese (q.v.). It lies about 30 m. S. of Samos, off the coast of Asia Minor, and covers 28 sq. m. The chief town is Marina (also called

Leros). Excellent white marble is quarried. Leros belonged to Italy at the time of the Second Great War, and after that country's surrender, Sept., 1943, a small British force was landed to forestall an expected German attack. A well-equipped naval base made the island valuable, but it was soon heavily bombed by the Germans. They landed Nov. 12 and the garrison surrendered in four days after fierce resistance. In 1947 Leros reverted to Greek possession.

Lerwick. Capital of the Shetland Islands, Scotland, a seaport and a police burgh. It stands on the eastern side of Mainland on Bressay



Lerwick arms



Lerwick, Shetland Isles. The town and harbour on Bressay Sound, from Bressay Island

Sound, 110 m. N. of Kirkwall. Buildings include a modern town hall and the Anderson Institute. Fort Charlotte, originally set up by Cromwell, is a naval centre. In the Second Great War Lerwick was a sea and air base of the Northern Patrol. It has a good harbour with ample accommodation for fishing boats and the storage of their catch, herring fishing and curing being the principal industry. Cured herrings are distributed hence to the islands. Pop. 5,307. *Pron.* Ler-wick.

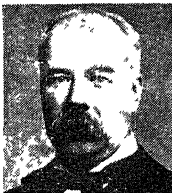
Le Sage, ALAIN RENÉ (1668-1747). French author. He was born at Sarzeau, in Brittany,



Alain R. Le Sage.
French author

Dec. 13, 1668. Educated by Jesuits, he was called to the bar in 1692. Entirely dependent upon his pen, he produced much that is now forgotten, but is remembered for one of his plays. *Turcaret*, 1709, the finest comedy of the period; for a novel, *Le Diable Boiteux*, 1707; and, above all for *Gil Blas* (*q.v.*), one of the world's masterpieces in fiction. He died Nov. 17, 1747.

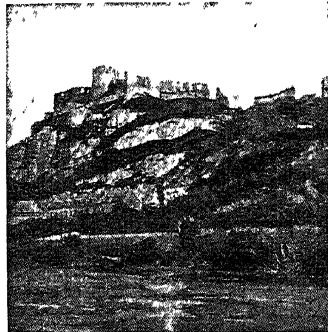
Le Sage, SIR JOHN MERRY (1837-1926). A British journalist. Born at Clifton, April 23, 1837, and educated there and at Bath and in London, he joined the staff of *The Daily Telegraph* in 1863. He acted as special correspondent in France, Germany, Italy, Russia, Egypt, the U.S.A., and Canada. With the German army in 1870-71, he was the first to send news of the German entry into Paris, and secured an interview with Napoleon III. He was earliest with the news of the death of Palmerston: was the first to inform Derby, then foreign secretary that Beacons-



Sir J. M. Le Sage,
British journalist
Elliott & Fry

field had ordered the British fleet to enter the Dardanelles; and reported the last speech of Cobden. For many years managing editor of *The Daily Telegraph*, he was knighted 1918. He died Jan 1, 1926.

Les Andelys. Town of France, composed of Le Grand and Le Petit Andely. It stands on the Seine, about 30 m. S.E. of Rouen in the dept. of Eure. Le Petit Andely has some old houses and the 12th cent. church of S. Saviour. Near it is Château Gaillard (*q.v.*). Le Grand Andely has the 13th-15th century church of Notre Dame, with some notable glass and works of art, and a 16th cent. hotel de



Les Andelys, France. Château Gaillard, on the rocks above the town

ville. The town has a trade in cattle and agricultural produce.

Lesbianism. Name commonly applied to tribadism, or sexual relations between two women. The word is frequently, but erroneously, derived from the island of Lesbos, the home of the poetess Sappho, who is said to have made a cult of tribadism. It comes more probably from Lesbia, the beautiful girl immortalised in Sappho's lyric describing in burning words and riotous imagery the whole passion of love; although this form of love was not in itself necessarily in any way homosexual. There was a legend that the women of Lesbos killed all their menfolk and established a totally feminine community. *See* Homosexuality.

Lèse-Majesté. Alternative spelling of legal term dealt with in this work under *Leze Majesty*.

Lesghians. Group of tribes occupying the mountainous district of Daghestan A.S.S.R., between the eastern Caucasus ridge and the Caspian Sea. They are round-headed whites of Alpine type, numbering 600,000. Isolated since Neolithic times, they have split into 27 tribes, each with its own dialect, all unwritten except that of the Avars. Fanatical Mahomedans, they are hunters and herdsmen, but have some terrace cultivation; their bleak habitat has made them less physically attractive than the Circassians. Felt tents and portable wooden huts are used. The famous Lesghian chief, Shamyl (1797-1871), resisted the Russians for 20 years.

Lesh or Alessio. Seaport of Albania. The ancient Lissus, it lies on the left bank of the Drin near the mouth, 20 m. S.S.E. of Scutari (Shkoder). It is the seat of an R.C. bishop. It was captured in the first Balkan War by Serbs and Montenegrins, Nov. 5, 1912; in the First Great War by Austrians, Jan. 26, 1916, and by Italians Oct. 27, 1918.

Lesina. Island of the Adriatic Sea, the Croatian Hvar. One of the S. Dalmatian islands, it was formerly Austrian and is now in Yugoslavia. It contains Lesina, a harbour with three ancient forts and an old arsenal, a relic of Venetian rule; Cittavecchia; Gelsa; and Verbosca, which has a church-fortress. Figs, wine, and anchovies are the chief products.

Leslie. Police burgh and market town of Fife, Scotland. It stands on the Leven, 12 m. S.W. of Cupar, and is served by rly. The burgh's chief building is the parish church, said to be Christ's Kirk on the Green, famed in a ballad attributed to James I. On the Green is the bull-stone, reminiscent of the time when bull-baiting was carried on. The industries include the making of linen, paper, and fountain pens, and the spinning of flax. Near the town is Leslie House, formerly the seat of the earl of Rothes, a magnificent house in a large park. The burgh grew up under the protection of the family who gave their name to it. Pop. 2,800.

Leslie, CHARLES ROBERT (1794-1859). British painter. Born in London, Oct. 10, 1794, of American parents, he was educated in Philadelphia, U.S.A. In 1811 he came to England and studied painting at the R.A. schools and also under West and Washington Allston. Made A.R.A. in 1821 and R.A. in 1825 he became professor of painting at the R.A. in 1848. At first he aimed at historical painting, but afterwards adopted a literary anecdotal style, and many of his most familiar works are large-scale book illustrations, e.g. *Uncle Toby* and *Widow Wadman*, and many scenes from Shakespeare. One of his best known pictures is that of Queen Victoria's coronation. He wrote a biography of John Constable, 1845, and a *Handbook for Young Painters*, 1855. He died in London, May 5, 1859.



C.R. Leslie
Self-portrait

His son George Dunlop Leslie (1835-1921) was also a painter, being elected A.R.A. in 1868 and R.A. in 1875. His pictures were mostly of English girlhood and of idyllic groups in ancient gardens.

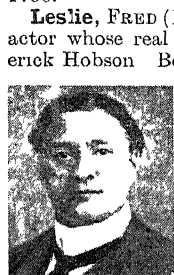
Leslie, DAVID (1601-82). Scottish soldier. A younger son of Sir Patrick Leslie, a Fife landholder, he sought fortune in the service of Gustavus Adolphus. He became a colonel in the Swedish army, but returned home in 1640 on hearing that war between Charles I and his enemies was imminent. He was made major-general in the army, commanded by Alexander Leslie, earl of Leven, that was raised to resist the English parliamentarians, and some claim that the victory on Marston Moor, 1644, was more his than any other's. Recalled to Scotland, he crushed Montrose at Philiphaugh, 1645, and served in the Highlands. He stood aside from the disastrous expedition that ended at Preston, but was the real commander of the Scottish army raised to oppose Cromwell. His authority having been weakened, he was defeated at Dunbar, 1650, and after Worcester 1651 was im-



David Leslie,
Lord Newark
After Lely

prisoned and fined. In 1661 Charles II made him Lord Newark. The peerage became extinct in 1790.

Leslie, FRED (1855-92). British actor whose real name was Frederick Hobson. Born at Woolwich, April 1, 1855, he made his earlier success as a baritone in comic opera, his *Rip Van Winkle* in Planquette's operetta of 1882 marking his greatest achievement as actor and singer. Developing rare powers as a comedian, and finding an admirable colleague in Nellie Farren, he became for seven years the mainstay of *The Gaiety* in a series of costume burlesques, beginning with *Little Jack Sheppard* and ending with *Cinder-Ellen* up too late. He died Dec. 7, 1892.



Fred Leslie,
British actor

Leslie OR LESLEY, JOHN (1527-96). Scottish prelate and historian. Born at Kingussie, Sept. 29, 1527, he was the rector's son. He himself, after a period at King's College, Aberdeen, and at Poitiers and Paris, became a priest. He became known as a learned and able defender of Roman Catholicism, and was one of those who fetched Queen Mary from France. Professor of canon law at King's College, judge of the court of session, member of the privy council, and abbot of Lindores, in 1565 he was chosen bishop of Ross.



John Leslie,
Scottish prelate

His zeal in Mary's cause led to his imprisonment in England during 1571-73, years after which he passed some years abroad, still seeking to aid her. He was made vicar-general of Rouen in 1579 and bishop of Coutances in 1593; but religious troubles in that country led to difficulties and imprisonment. He died in an Augustinian monastery near Brussels, May 30, 1596. Leslie wrote in Latin a history of Scotland, trans. E. G. Cody, 1888-95. He wrote also in defence of Mary and her title to the throne.

Leslie, SIR JOHN (1766-1832). Scottish physicist and mathematician. Born at Largo, Fife, April 16, 1766, and educated at St. Andrews university, he went to Virginia in 1788 as tutor to the sons of a planter there. Returning to London in 1790, he spent 15 years travelling and lecturing. In 1793 he translated Buffon's *Natural History of Birds*. His most important work was the invention of the differential thermometer, a hygrometer, and a photometer.

In 1804 Leslie published his *Experimental Inquiry into the Nature and Propagation of Heat*, for which he received the Rumford medal of the Royal Society. In 1805 he was appointed professor of mathematics at Edinburgh, in 1810 he invented a method for the artificial production of cold by means of sulphuric acid and an air pump, and in 1819 he was made professor of natural philosophy at the university. His *Elements of Natural Philosophy* began publication in 1823, but was left uncompleted. Knighted in 1832, he died Nov. 3.

Leslie, THOMAS EDWARD CLIFFE (1827-82). Irish economist. Born in co. Wexford, he was educated at King William's College, I.O.M., and at Trinity College, Dublin. Called to the bar in England, he accepted in 1853 the post of professor of jurisprudence and political economy at Queen's College, Belfast, and devoted the rest of his life to the study of economics. His writings, which include *Land Systems and Industrial Economy of Ireland, England, and Other Countries*, 1870, and *Essays on Political and Moral Philosophy*, 1879, advocate making land more productive by freeing it from antiquated tenures and methods of transfer; he is regarded as the founder in Great Britain of the school that treats political economy historically rather than philosophically. See *Political Economy*.

Lesmahagow. A village and parish of Lanarkshire, Scotland. It stands on the Nethan, 5 m. S.W. of Lanark, and has a railway station. A priory was founded here in the 12th cent., the parish church now occupying the site. This is the centre of a coal mining and fruit growing district. Near are the ruins of Craignethan Castle. The parish is a very large one. Pop. 12,000.

Lesnes Abbey. Remains of an Augustinian abbey, at Abbey Wood, Erith, Kent, England. They are 12½ m. by railway E. of Charing Cross terminus, and consist of a part of the walls and the monks' fishpond. The abbey, sometimes called Lesnes, Lessness, or, as in Domesday, Loines, was

founded in 1178 by Richard de Lucy, justiciar of England, on rising ground at the edge of Erith marshes. It was suppressed by Wolsey in 1525, its revenues being diverted to his colleges at Oxford and Ipswich. The property was seized by Henry VIII, and in the 17th century was settled on Christ's Hospital. Stone coffins and other relics have been found and may be seen in the parish church of S. John the Baptist, Erith.

Lespinasse, JULIE JEANNE ÉLÉONORE DE (1732-76). French writer. Born at Lyons, Nov. 9, 1732, she came to live in Paris with Mme. du Deffand in 1754. After a quarrel she formed a rival salon in the Rue S. Dominique, which became a centre of the Encyclopédistes and other brilliant literary figures, her most intimate friends being Turgot, d'Alembert, who for some time lived in her house, and Charles Hénault. She died May 23, 1776. Her letters, 1773-76, first published 1809, contain the story of her absorbing passion for Count Jacques Antoine Guibert (1715-86); this affair, which hastened her death, followed her earlier love for the Spanish marquis of Mora. *Consult* Julie de Lespinasse, P. de Ségur, Eng. trans. 1907.



Julie de Lespinasse, French writer

Lesse. A river of Belgium. It rises in the Ardennes and flows generally N.W. to the Meuse at Dinant. Close to Han it disappears underground and flows through the celebrated Grotto of Han, known since 1771 and first explored in 1814. Below Houvet it occupies a beautiful wooded valley.

Lesseps, FERDINAND, VICOMTE DE (1805-94). French diplomatist and engineer. Born at Versailles, Nov. 19, 1805, he entered the consular service in 1825. While stationed at Alexandria he conceived the idea of a canal across the isthmus of Suez. Lesseps was an able and successful consul, both at and in Cairo, and on his return to Europe in 1837 he was



able and successful consul, both at and in Cairo, and on his return to Europe in 1837 he was

successively consul at Rotterdam, consul-general at Barcelona, and minister of France at Madrid.

He retired in 1849, and in 1854 secured the concession for his Suez Canal. Indifferent to political opposition and the doubts of the engineering world, he organized his company in 1858, and eleven years later the canal was opened by Ismail Pasha. Other schemes occupied Lesseps until in 1879 he was persuaded to undertake the Panama Canal scheme. The failure of this ruined him financially, and his name was implicated in the scandals resulting from its mismanagement. He died Dec. 7, 1894. By his first wife (m. 1837) he had five sons; by his second (m. 1869) he had 12 children. *See* Panama Canal; Suez Canal; *consult* Lives, G. B. Smith, 1893; H. J. Schonfield, 1937.

Lesser Slave. Lake of Canada. It is 480 sq. m. in extent and lies almost in the centre of Alberta. Its waters are carried to the Athabaska river, and then by stages to the Arctic Ocean.

Lessing, GOTTHOLD EPHRAIM (1729-81). A German critic and dramatist. Born at Kamenz, in Saxony, Jan. 22, 1729, the son of a pastor, he was educated at Meissen, Leipzig, and Wittenberg, studying theology, philosophy, and



Gotthold Lessing, German critic and dramatist

medicine. The drama also attracted him. He became associated with Voltaire and in Berlin with Moses Mendelssohn and contributed to the *Vossische Zeitung*. In 1760 he accompanied Gen. Taubentzen as secretary to Silesia. In 1767 he was critic and adviser to the new national theatre at Hamburg, and engaged in an antiquarian controversy with Klotz of Halle. In 1770 he became librarian to the duke of Brunswick at Wolfenbüttel. He married in 1776 Eva König, whose death and that of their child was an almost mortal blow to him. By publishing some posthumous papers of a free-thinking friend, he was involved in a keen controversy with Pastor Goeze. He died at Brunswick, Feb. 15, 1781.

Lessing's most influential works are *Laocoon*, 1766, a critical treatise on the limits of painting and poetry; the blank verse drama,

Nathan the Wise, 1779, an outcome of his controversy with Goeze and a unique plea for religious toleration; and *Hamburg Dramaturgy*, 1767-69, a critical commentary on the productions at the national theatre. Miss Sara Sampson, 1755, influenced by Richardson, was the first tragedy of common life in Germany; *Minna von Barnhelm*, 1767, the first real German comedy, which still holds the stage. Other works include the comedy, *The Young Scholar*, 1748; *Trifles* (poems), 1751; *Letters on Literature*, 1759-65; *Antiquarian Letters*, 1768-69; *How the Ancients Depicted Death*, 1769; *Contributions to History and Literature from the Treasures of the Wolfenbüttel Library*, 1773-81; a treatise on *The Education of the Human Race*, 1780.

Lessing was a pioneer of the modern German study of Greek literature and a champion of Shakespeare. He maintained that the ultimate appeal of all art is to the imagination through the senses. The *Laocoon* is unfinished; like Aristotle's *Poetics*, it is a series of rough notes, but, with the *Dramaturgy*, it served to overcome the numbing influence of French neo-classic orthodoxy and to stimulate native German art and criticism. In Saintsbury's phrase, Lessing gave the Germans Goethe and the English Coleridge. While his style is notable, his most valuable quality is the stimulus he gives the reader. But his influence was temporarily eclipsed by the Storm and Stress movement. *See* Germany; Literature; *Laocoon*.

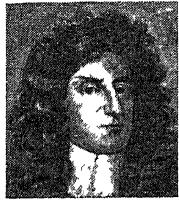
Bibliography. *Dramatic Works*, ed. E. Bell, 2 vols., 1879; *Selected Prose Works*, ed. E. Bell, 1890; *Works*, ed. K. Lachmann and F. Muncker, 21 vols., 1886-1907; *Lives*, J. Sime, 1877; H. Zimmern, 1878; T. W. H. Rolleston, 1889; L., the Founder of Modern German Literature, H. B. Garland, 1937.

Lesson or Lection. Term used in the Church of England for a passage of Scripture read during divine service. *See* Lectionary.

Leste. Hot dry S. wind that blows from the Sahara over the Madeira Islands in front of an approaching depression.

L'Estrange, SIR ROGER (1616-1704). An English journalist and author. He was the second son of Sir Hamon L'Estrange (1583-1652); was born at Hunstanton, Dec. 17, 1616, and is said to have been educated at Sidney Sussex College, Cambridge. In Rupert's Horse, he accompanied Charles I to Scotland, 1639, and in 1644, for

plotting the recapture of King's Lynn from the parliamentarians, was sentenced to be shot, a sentence com-



Sir Roger L'Estrange,
English author
After Kneller

tence commuted to four years' imprisonment. In 1648 he failed to raise an insurrection in Kent, and fled to the Continent, where he acted as Hyde's agent on behalf of Charles II.

He returned to England under an amnesty in 1653, becoming known as "Oliver's fiddler" from his skill on the bass viol, and wrote anonymous pamphlets directed against the Puritans. Appointed surveyor of the imprimery and licenser of the press, 1663, he suppressed all the papers hostile to the Restoration, and issued *The Intelligencer* and *The News*, 1663-66; *The City Mercury*, or *Advertisements concerning Trade*, 1675-80; and *The Observer*, 1681-87. He became M.P. for Winchester, 1685, and was knighted by James II. Deprived of office when the Revolution broke out, and undergoing several terms of imprisonment, he died Dec. 11, 1704.

Roger L'Estrange was both venal and tyrannical in office. His personal character won for him the sobriquet of "the dog Towzer." But he wrote well, was a scholar, and possessed wit and humour. In addition to his periodicals, important in the history of the English press, and his pamphlets, he translated Aesop, Cicero, Josephus, and the *Letters of a Portuguese Nun*.

Le Sueur, EUSTACHE (1617-55). A French painter. Born in Paris, Nov. 19, 1617, he studied under Simon Vouet. He was one of the twelve original members of the French academy, and produced several important and decorative paintings, notably those representing the Life of S. Bruno, for the monastery of the Chartreuse; these are now in the Louvre. His art was largely inspired by Raphael. He died in Paris, April 30, 1655.

Letchworth. An urban district of Hertfordshire, England. It is 34 m. by railway, N. of King's Cross, London, terminus. The village was chosen for the site of the first garden city in England, and in 1903 this was laid out on spacious lines, with a green belt surrounding the town. A Jacobean manor house was turned into an hotel, and the old church remains, but the other buildings are

modern. Letchworth has engineering and printing industries and makes parachutes and corsets. Pop. 20,013. See Garden City.

Lethal Chamber. A room or receptacle in which living creatures can be put to death painlessly by the admission of poisonous gas or chloroform. For painless destruction of cats or dogs there is available a chamber called the Snow box, 11 ft. long, 5 ft. wide, and 4 ft. 6 ins. high. On the top are two air-holes, one of which has a double cover, the first perforated and the second solid. The other air-hole is closed by a solid lid. The animal is placed in the box and a linen cloth soaked in chloroform inserted in the hole closed by the solid lid. Air circulating through the perforated hole causes the anaesthetic to mix with air in the box and brings painless death to the animal without first choking it. In the Davies chamber carbon monoxide is circulated through a glass box containing the animal, and gradually drives the air out of the chamber through a hole in the roof.

In the U.S.A., Arizona, California, Colorado, Missouri, Nevada, North Carolina, Oregon, and Wyoming use lethal chambers for the execution of murderers. The method introduces carbon monoxide into the condemned cell when the prisoner is asleep and at a date and time unknown to him. During the Nazi regime in Germany and German-occupied countries, large lethal chambers were installed at concentration camps for the mass killing of Jews and other persons obnoxious to the authorities. The largest of these was set up at Oswiecim (*q.v.*) where thousands were executed daily.

Lethbridge. City of Alberta, Canada. On the Old Man River in the S. of the province, it has a station on the C.P.R. and C.N.R., 145 m. S.S.E. of Calgary, and is on an air line. It is the distributing centre of a coal mining and wheat growing district; has a street railway, electric power, and natural gas; and is a headquarters of the Royal Canadian Mounted Police. Some 30 industries include a dehydration plant. Pop. 14,612.

Lethe (Gr., forgetfulness). In Greek mythology, a river of the lower world. When the souls of the dead drank of its waters, they forgot the events of their previous existence. *Prom. Leeth-ee*.

Leto. In Greek mythology, the mother of Apollo and Artemis by Zeus. His love for her aroused the jealousy of Hera, who sent the

serpent Python to pursue Leto while she was pregnant. She fled far and wide, finding no rest, fear of Hera's wrath deterring everyone from receiving her. At last in pity Poseidon fixed the floating island of Delos, and there Leto gave birth to the twins, Apollo and Artemis. Leto was called Latona by the Romans.

Le Touquet. A French holiday resort. Situated in the Pas-de-Calais, 3½ m. W. of Étaples at the mouth of the Canche, it faces the English Channel, and is famous for its fine stretches of sand and pine woods. Before the Second Great War it attracted many British visitors. In 1940 it became part of German-occupied France; and was liberated in ruins by the Canadians, Sept. 1944.

Letter (Lat. *littera*, ultimately from *linere*, to besmear, daub). A writing, as some early writings were on tablets smeared over with wax. The word is now used in two main senses: for a written communication, usually sealed and sent through the post, and for a character of the alphabet, *e.g.* the letter C. It is used also for a literal as opposed to a figurative meaning of anything, *e.g.* the letter killeth, but the spirit giveth life. Of the many compounds, letterpress is used for printed matter, while the plural letters conveys a suggestion of scholarship, *e.g.* a man of letters. See *Letters*; *Post Office*; *Printing*.

Lettering. Term commonly used to signify the art or craft of designing inscriptions of all kinds so that they shall be both legible and pleasing to the eye. It is a recognized branch of design, the limits of which are the letters of the alphabet, and is closely allied to both writing and typography. Not only signwriters and commercial artists, but book illustrators, sculptors, and many other kinds of artist find a knowledge of good lettering and a facility in the art to be desirable if not essential.

The 20th century brought a long delayed revival in the study and practice of good lettering and an appreciation of its advantages over the ugly types prevailing throughout the 19th century. The precept and example of such teachers as Edward Johnston and Graily Hewitt led a return to the fine proportions and unsurpassed legibility of classic Roman models, notably the incised lettering on the Trajan monument, Rome, and to the natural penstroke lettering of medieval MSS. Many important firms, *e.g.* W. H. Smith & Sons,

were quick to realize that good taste in lettering might be a commercial asset. A notable contribution to the spread of good lettering was made by London's Underground railway, which commissioned Johnston to design a new sans-serif alphabet of unusual simplicity and clarity, adopted as standard for all signs, notices, posters, etc., on the Underground. This form was widely copied. Well-proportioned lettering on the name-boards of streets (*e.g.* in the streets of Westminster) and of houses, and even on the sides of delivery vans, was no longer a rarity. The notice boards of the National Trust offer another pleasing example. Script lettering written with a broad-pointed pen adopted and modernised from medieval examples has become popular for show-cards, ticket-writing, etc. A parallel tendency towards a direct and recognizable historical basis has been noticeable in typography.

There is still scope for originality in the design and treatment of lettering. As long as it remains an art it cannot be in danger of becoming finalised or formalised. In this branch of art, as in others, the canons of taste invariably change. Whatever its style, the only criterion for good lettering is its legibility. In rescuing the public from the indifferences of the past and from an indulgence in grotesqueness for grotesqueness' sake lies the chief contribution of the 20th century revival. *See* Sign; Typography; Writing.

Letterkenny. Market town of Donegal, Eire. It stands on the Swilly, 17 m. W.S.W. of Londonderry, with which it is connected by a local railway. Here is the fine modern R.C. cathedral of the diocese of Raphoe. The port is Port Ballyraine, a mile away on Lough Swilly. Market day, Fri. Pop. 2,308.

Letter Missive. In law, term for a letter formerly sent instead of a summons by the lord chancellor to a peer made defendant in the court of chancery, requesting him to appear there and furnishing him with a copy of the bill. The term letter missive is also applied to the letter sent by the sovereign to a dean and chapter containing the name of the person whom he would have them elect as bishop. *See* Congé d'élire.

Letter of Credit. In banking, circular letter written by a banker in one country to a banker or bankers in other countries, in favour of a client specifically

mentioned by name therein, and guaranteeing him financially up to a specified amount. *See* Banking.

Letter of Marque. Name once given to the commission to make prize of enemy subjects' ships and goods, issued in time of war. These commissions were issued by the admiralty, or by the admiral commanding on a foreign station, to owners of private ships which were termed privateers, and the sovereign allowed a market to be found for the enemy property so seized. Often the only difference between privateers and pirates was that the former had letters of marque and the latter had not. A captured privateer was not supposed to be treated as a pirate. Letters of marque were abolished by the treaty of Paris, 1856. *See* Privateer.

Letters. Written messages or communications. They have an important place as literature and as material of history. The letter form has frequently been adopted by authors who wished to use an easy method of expressing their views on certain subjects, and such letters have played an important part in various controversies, but it is mostly the familiar friendly letters, not designed for publication, that possess the greatest charm and have won most fame for their writers. Cicero's Letters among the ancients, and those of Erasmus in the 15th-16th century may be noted.

The earliest notable English letters of the informally familiar kind are the Paston Letters (*q.v.*). The 18th and 19th centuries were particularly rich in writers whose familiar letters have become

a notable addition to both French and English literature; among them may be mentioned Madame de Sévigné, Gray, Horace Walpole, Cowper, Byron, Shelley, Lamb, FitzGerald, Jane Carlyle, Stevenson, G. M. Hopkins. Among literary works cast in the form of letters mention may be made of Pascal's Provincial Letters, against the Jesuits; Swift's Drapier's Letters, against Wood's halfpence; Chesterfield's Letters to his Son, on the fitting behaviour of a gentleman; The Letters of Junius, a political treatise; Scott's Paul's Letters to his Kinsfolk, impressions of a visit to Waterloo and Paris, and his Letters of Malachi Malagrowther, against the suppression of small bank notes; and Sydney Smith's Peter Plymley Letters, on R.C. emancipation. *Consult* English Letter Writers, C. E. Vulliamy, 1945.

Letters Patent. In English law, letters under the great seal of England. They usually grant to some person or company a privilege, *i.e.* a right not enjoyable under the general law. *See* Patent Law.

Lettre de Cachet. Name given in France to an order signed by the king and sealed with his own seal. Their most frequent use was to commit a person to prison without inquiry or trial, and they were defended on the ground that the king was above the law. They first appeared as actual documents in the 14th century. They were also used to call meetings of estates and other bodies. In later centuries the letters were issued on a very large scale by those responsible for the maintenance of order, quite without the knowledge of the king, for purposes not unlike those employed by the police in dealing with suspected persons in an area under martial law. Their use continued until the Revolution, when they were abolished. For a short time they were employed by Napoleon. *See* Bastille.

Letts. Dominant people of the Baltic state of Latvia S.S.R. Numbering 1,435,937 at the Russian census of 1897, they subsequently took considerable part in the migratory movements from E. Europe to the U.S.A. Of North European stock, they are tall, robust, long-faced, blue-eyed, self-reliant, two-thirds being pure blondes. The Lettish dialect, with Lithuanian and Borussia or Old Prussian, formed the older or Baltic sub-group of the Balto-Slavonic group of Indo-European languages. The Letts are mostly



Letts. Peasant couple from a farm in Latvia

Lutherans, but minorities profess Orthodox or Latin Christianity.

From their cradleland in the Niemen basin, where they practised agriculture, they were driven N. by Slav pressure, and overran or absorbed the primitive hunting tribes of Finnish stock who preceded them. Living in the Duna marshlands, they long preserved in isolation their ignorance of writing and other civilized arts. During the 13th cent. their subjugation, begun by the Livonian, was completed by the Teutonic order, to which they owed both their conversion to Christianity and their state of servitude. See Latvia.

Lettuce. A hardy annual vegetable, in demand for salad chiefly in spring and summer. The botanical name is



Lettuce. Specimen of cabbage lettuce

Lactuca, of the family Compositae. Seeds sown at fortnightly intervals from March to July in well dug and manured soil will yield

a continuous supply of salad. In hot, dry weather lettuce should be sown in partial shade and kept moist. A hardy variety like Arctic King, sown in Aug. and transplanted in Oct., will be ready for pulling in April; protection by cloches is helpful but not essential. Other sowings may be made under glass in Sept. and Jan.-Feb. There are many varieties of the upright cos and flat cabbage lettuces.

Leu. Rumanian silver coin, in the plural lei. The unit of the country's coinage, it was once equivalent to a franc, its nominal value being 9½d. It was divided into 100 bani and was coined in 1, 2, 5, 20, 100, 200, and 500 lei pieces. As a result of inflation after the Second Great War, the coin lost its value; a 20-lei taxi fare in 1943 had become 40,000-60,000 by 1947. That year there was minted a 2,000-lei piece, with which one could buy a newspaper.

Leuchars. A village of Fife, Scotland, near the estuary of the Eden, 6 m. N.W. of St. Andrews, for which it is a junction on the main railway line. Here is a large R.A.F. station where throughout the Second Great War squadrons of Coastal Command were based and a direct air route from Stockholm terminated. The 12th century church has fine Romanesque work and a belfry of later date. Pop. 3,221.

Leucine (Gr. *leukos*, white). A white, pearly substance derived from animal proteins. It is found also in the vetch, potato, and gourd. It is conveniently prepared by boiling horn with dilute sulphuric acid in a reflux apparatus for twenty-four hours. The liquid is neutralised with quick-lime, filtered, concentrated, and evaporated until crystals of leucine separate. Leucine, which has biochemical importance, has been made synthetically from ammonia and bromocaproic acid.

Leucite. One of the feldspathoid group of minerals, consisting of potassium aluminium metasilicate. Leucite crystallises as water-clear isometric crystals or grains with anomalous optical properties; when heated to 500-600° C., these anomalies disappear. It occurs as a primary mineral in volcanic rocks low in silica and rich in potash, and principally in fresh or recent types such as the lavas of Vesuvius. Leucite is worked in Italy for the production of fertilisers and aluminium.

Leuckart, KARL GEORG FRIEDRICH RUDOLF (1822-98). German zoologist. Born at Helmsstedt, Oct.

7, 1822, he was educated at Gottingen. In 1850 he was appointed professor of zoology at Giessen, and in 1869 at Leipzig. An authority on parasitic worms, his work on the subject was issued in England as *The Parasites of Man*, 1886. He also put forward the now accepted classification of the animal kingdom. Leuckart published many works on zoology and kindred subjects, including polymorphism. He died Feb. 6, 1898.



Karl Leuckart, German zoologist

Leucocytes. Name given to the white corpuscles of the blood. Leucocytosis is a term for a temporary increase in the number of the white corpuscles. It occurs normally during the process of digestion, and indicates the course of various fevers and germ invasions. See Blood.

Leucocythaemia or **LEUKAEMIA** (Gr. *leukos*, white; *haima*, blood). Disease characterised by a permanent increase in the number of leucocytes or white corpuscles in the blood, with enlargement and changes in the spleen, lymphatic glands, and bone marrow. Its cause is unknown, but it is a malignant disease affecting the whole

body. The condition is more frequent in males than females, and generally begins between the ages of 30 and 50. It has been known to follow injury to the bones.

Several forms are recognized, myeloid leukaemia being the most common. The onset is gradual, shortness of breath, palpitation, or swelling of the abdomen, owing to enlargement of the spleen, being generally the first symptoms of which the patient complains. Pain and tenderness may be felt over the region of the spleen on the left side of the body. The condition gradually becomes worse. Dropsy may occur, and haemorrhages into the skin, pleura, peritoneum, or from the nose, are common. Nausea and vomiting may occur from the beginning. The disease is usually fatal within three years, but the patient can be made comfortable by treatment involving arsenic and X-rays.

Lymphoid leukaemia is characterised by enlargement of the lymphatic glands. It may be either acute or chronic. In the acute form, the glands beneath the jaw and the tonsils and pharynx become swollen and painful, and may ulcerate. Swelling of the glands of the neck also occurs. There may be haemorrhage into the skin and excessive bleeding from the nose. Rapid anaemia may follow, and death may occur in a week or two. In the chronic form, enlargement of the glands in the neck and then of those under the arms is the most prominent symptom. Some cases present a mixture of the symptoms of both myeloid and lymphoid leukaemia. Lymphoid leukaemia is almost invariably fatal, though life may be prolonged by the use of X-rays on the enlarged glands.

Leucoderma. Affection of the skin characterised by loss of pigment. The cause is unknown. Some cases have followed shock, and others have occurred in the course of exophthalmic goitre. White patches, generally with rounded outline, appear on the skin, and the pigment is increased in the surrounding areas. Treatment has little influence.

Leucoplastids. Colourless and often rod-shaped masses of protoplasm found embedded in the cytoplasm of many plant cells which are not exposed to light. They are frequently concerned with the deposition of storage food, e.g. associated with the formation of storage starch grains, called amyloplasts. Leucoplastids differ from chloroplastids in lacking

pigments. But in *e.g.* a young potato tuber, they need only to be illuminated for the pigments to be developed and the leucoplastids to become chloroplastids.

Leucoplakia Oris. Formation of white patches on the tongue in the course of the disease known as chronic superficial glossitis, or inflammation of the tongue. This disease is frequently due to syphilis and is often associated with excessive smoking, alcoholism, and roughness of the teeth, which irritates the tongue. At first the papillae of the tongue become enlarged and red. Later, these areas are replaced by the white patches, and in a still later stage the epithelium is completely shed, leaving the tongue smooth and red. Cracking or fissuring of the surface may occur at any stage, and cancer may develop in the vicinity of one of these cracks. Treatment consists in giving up smoking and alcohol. The teeth should be attended to. The mouth should be washed out frequently with a solution of borax. *See Tongue.*

Leucotomy, PRE-FRONTAL. Surgical severing of nerves of the frontal lobes of the brain. *See Brain* (p. 1370); *Melancholia*.

Leuctra. In ancient Greece, a village of Boeotia between Plataea and Thespieae, famous for the victory gained by Epaminondas over the Spartans in 371 B.C. Epaminondas had evolved a new military formation in which two lines of equal length fought simultaneously. Epaminondas concentrated numbers at a particular point, and brought that part of the line first into action. Mainly as a result of the new tactics, the Spartans were completely defeated, and the hegemony of Greece, passed into the hands of the Thebans. On the field of battle the Thebans set up a trophy, some remains of which are supposed to have been identified.

Leuk or **LOËCHE.** A town of Switzerland, in the canton of Valais. It stands on a tributary of the Rhône, among the Bernese Alps, 41 m. by rly. N.E. of Martigny on the Simplon rly. At an alt. of 2,470 ft., it commands a fine view of the junction of the Dala with the Rhône. A picturesque old fortress, it is a starting place for *Loècheles-Bains* (Leukerbad), 10½ m. N. by road, whose celebrated hot mineral springs are beneficial to rheumatism and skin diseases.

Leukaemia. Variant name of *Leucocythaemia* (*q.v.*).

Leukas or **LEVAS** (mod. Santa Maura). One of the Ionian Islands, off the coast of Acarnania. The



Leukas, Ionian Islands. Lighthouse on Cape Dukato

town of Leukas was founded about 650 B.C. by the Corinthians, who dug a canal through a spit of gravelly land, which formerly joined the island to the mainland. Over this a bridge was afterwards built, so that ancient writers spoke of Leukas sometimes as an island, sometimes as a peninsula. In the time of the war between Philip of Macedonia and Rome the town was the capital of Acarnania, then part of Macedonia. In the S. is the promontory of Leukatas (mod. Dukato), whence Sappho is supposed to have thrown herself into the sea. The area of the island is 111 sq. m., length 23 m. Products include wine, oil, and currants.

Leuna. Synthetic oil plant in Germany. Situated 12 m. W. of Leipzig, it was the largest installation of its kind in Germany, employing over 30,000 workers during the Second Great War. It was frequently bombed by Allied air forces, and production ceased early in 1945. Captured by troops of the U.S. 1st army on April 15, 1945, the plant was confiscated as part of the assets of the I.G. Farbenindustrie. Restored by the Russians, being in their zone of occupation, it was soon producing 20 p.c. of its wartime output.

Leuthen. A village of Silesia, since 1945 under Polish rule. About 10 m. W. of Breslau, it is noted for the battle fought here during the Seven Years' War, Dec. 5, 1757, between the Prussians under Frederick the Great, and the Austrians. The Austrian Army under Prince Charles of Lorraine had advanced from Breslau on the Oder to take up a position astride the Neumarkt-Breslau road, its centre behind Leuthen and its outposts farther W. near Borne. The Austrians were deployed in two lines, 6 m. long, with cavalry on both flanks.

The Prussian army under Frederick, marching from Leipzig E. into Silesia, on Dec. 3 had reached Parchwitz, where Frederick told his generals that he intended to attack an army nearly thrice his strength. He offered a free discharge to any who might not have the stomach for a desperate fight, but mentioned that if a cavalry regiment misbehaved he would have it unhorsed and made into a garrison regiment, and that an infantry regiment which should display the least hesitation in attack would lose its colours and be deprived of the facings of its uniform. Frederick had revived the ancient principle of the phalanx, had introduced concentration of fire, and the flank attack or envelopment: and he was fortunate in having as his opponent on this occasion a general who was wedded to linear tactics, which involved the parallel order and a frontal attack.

On Dec. 5 Frederick advanced to Borne and drove in the Austrian outposts, who fell back upon the right, and induced a belief that this flank was in danger, so that presently Daun, second in command to Charles, brought a mass of cavalry from the reserve and from the left flank to the support of the right, where Lucchesi was in charge. But it was the Austrian left flank that Frederick meant to assail, leaving only his advanced guard at Borne to deceive the enemy. Thus at Sagschütz Nadassdy was called upon to oppose the main Prussian army, with which were Ziethen and Prince Moritz, who had ten siege guns, besides 61 other heavy pieces.

The Prussians advanced, and the Austrian left flank was irretrievably ruined before help could be brought. But as the left was rolled up N. the right was wheeled to face S., with the result that in the afternoon Leuthen village was the scene of terrible confusion. At last Lucchesi attempted to gain time and relieve the pressure on the infantry by a charge against the Prussian left flank. But Frederick still had his reserves, and Driesen's squadrons, hidden in a hollow, fell upon Lucchesi's horsemen in flank and rear immediately they had galloped by. The effect of this stroke decided the result of the battle. Lucchesi was killed and his men routed, and then Driesen attacked the Austrian right flank.

This was the beginning of the end, for although Charles rallied to the E. of Leuthen, at Saara, the Prussians at sundown hurled the

enemy back upon the river, and those who could not escape by the bridges were captured to the number of 21,000, while 10,000 Austrians were left on the field, of whom 3,000 were slain. The Prussians took 116 guns and 51 regimental colours, at a cost of 1,141 killed and 5,118 wounded.

Napoleon declared this battle to be a masterpiece of movements, manoeuvres, and resolution. It was decisive, *i.e.* the beaten side could fight no more for the season, and was compelled to yield Silesia to the victor, except for the fortress of Schweidnitz. The Austrian general was disgraced, for only 37,000 rank and file reached Bohemia ten days after the battle. The rest of his 80,000 had perished or were prisoners as the result of Frederick's masterly handling of 30,000 men. *See* Frederick II; Seven Years' War. *Pron.* Loy-ten.

Lev. Bulgarian silver coin, in the plural leva. The unit of the country's monetary system, it was once equivalent to a franc, its nominal value being 9½d. It is divided into 100 stotinki, and is coined in 1, 2, 5, 10, 20, 50, and 100 pieces. Before the First Great War gold pieces of 10, 20, and 100 leva were coined.

Levallois-Perret. A town of France. In the dept. of Seine, it lies N.W. of Paris, of which it is a suburb. There are iron and chemical works and distilleries as well as other industries. Pop. 61,681.

Levant, *THE* (French *levant*, rising, *i.e.* Orient). Name applied to the Eastern Mediterranean in general, and more particularly to the coast of Asia Minor, Syria, Lebanon, Palestine, and Egypt.

In the Middle Ages trade with the Levant for spices, ivory, rich silks, gems, carved jade, and other valuable products of the Far East was maintained chiefly by French and Italian merchants, and England obtained such wares from the Venetian fleets which annually reached the North Sea. Various causes forced English merchants to send merchant fleets into the Mediterranean, and in 1553 Anthony Jenkinson established trading relations at Aleppo.

Levant trade suffered in the early days from the depredations of Mediterranean pirates, and from the development of the oceanic route to the Far East, with the consequence that it was gradually confined to the exchange of English commodities for the products of the Ottoman Empire. It steadily declined in importance until the opening of the Suez Canal route

again took British ships in large numbers to Levantine seas. *See* Mediterranean Sea.

Levant Company. An English company which traded with the Levant from 1592 to 1825. In 1581 a Turkey company was formed to trade with that country, with which a commercial treaty was concluded, and to which an ambassador, paid by the company, was accredited; and in 1592 this company and a rival concern were united as "the governor and company of merchants of England trading with the Levant seas."



Levant Company seal

Its vessels went to and from Constantinople and the Near East, and exchanged woollens and tin for currants and spices, carpets, shawls, drugs, and raw silk. After 1750 the monopoly enjoyed by the company was seriously interfered with by pirates and others, and in 1754 the company, until then a close corporation, opened its doors in return for a payment of £20. In 1803 the British government took over from the Levant company the payment of the ambassador in Constantinople, and in 1825 the charter was given up. The bulk of the company records are in the Public Record Office, London. It had establishments at Constantinople (Istanbul), and branches at Aleppo and Smyrna (Izmir).

Levanter. Easterly wind which blows in the Straits of Gibraltar. It is most frequent in March and from July to Oct., being associated with high pressure over W. Europe and low pressure to S.W. over the Atlantic. Eddies, dangerous to aircraft, are produced in the lee of the Rock which, if the wind is not too strong, is capped by a banner cloud generally stretching about a mile to leeward.

Levant et Couchant (Fr. rising and lying down). English legal term. A person occupying land to which is attached a right of pasture over common land may turn upon the common as many cattle as can be maintained during winter by the produce of the land to which the right of common belongs. These beasts are said to be *levant et couchant*.

Leveche. Hot, dusty wind that blows from the Sahara over S.E. Spain ahead of a depression. The great heat, almost as much at midnight as at midday, destroys vegetation. When it approaches

a brownish cloud may be seen on the S. horizon. *See* Sirocco.

Levee (Fr. *lever*, to raise). A reception held by a king or other ruler of such gentlemen as have the right of entry or presentation. The ceremony is derived from France, where it was the custom for the king, during the elaborate ceremonies of rising from bed, to receive nobles and others having business. In Great Britain, levees are for men only and are held in the daytime; presented to the sovereign are persons appointed to various offices, officers of the navy, army, and air force on promotion, and other approved persons who for social or other reasons desire the honour. The governor-general of Canada holds levees in the sovereign's name. The corresponding function at which women are presented is called a drawing room. *See* Royal Household. *Pron.* Levay.

Levee. Natural embankment formed by a river as it flows over a nearly level flood-plain. A river in flood carries a large amount of detritus. Where the flow is most rapid, as in the main stream, this material is swept along in suspension, etc. Where the river spreads out on to the flood-plain, the velocity of flow is checked and the load is dropped by the waters. The most sudden checking of velocity is at the edge of the main channel; here most of the material is deposited. Farther out on the flood-plain fine mud only tends to be laid down.

Moderate floods increase the rate of formation; excessive floods cover the levees or burst through them. Beyond the levees are stagnant marshes at a lower level than the river bed. The Mississippi has well-defined natural levees, which have prevented former tributaries from joining the main stream, and forced them to find an independent course to the sea. The bursting of these in 1937 caused disastrous floods, drowning 300 people, rendering 1,000,000 homeless, and destroying vast stretches of agricultural land in four states. Property suffered to the value of £105,400,000. The U.S. govt. initiated a scheme to extend the artificial levees for better control of the flood waters; this was additional to the 2,000 m. of artificial levees already existing. Natural levees may be planted with trees or embanked, so that they become permanent; New Orleans is built upon such foundations. The dykes of Holland are of this type. *See* Hwang-ho; Po.

Levée en Masse. French term meaning the emergency mobilisation of all able-bodied men of a country for military service in the face of some national danger, *e.g.* a threat of invasion. This differs from conscription in that men called up are armed with any weapons available and formed into fighting units before they may have received uniforms. The expression came into general use during the raising of the French Revolutionary armies. A similar levée en masse was conducted by the Prussians in 1812 to resist the French. A modern instance was provided by the raising and expansion of the Home Guard (*q.v.*) of the U.K. in the Second Great War. Under the Hague Regulations persons spontaneously taking up arms are entitled to the privileges of armed forces, albeit they wear no distinctive uniform, if they act openly and observe the laws of war. Persons rising against an enemy after he has occupied their country are not so protected.

Level. An instrument used for obtaining a horizontal surface or for measuring the departure of a surface from the horizontal. The common form is the spirit level, a glass tube bent in the arc of a large circle and filled with alcohol save for a small bubble of air. The plane of the circle is held vertical, the bubble seeking the highest position in the tube, so that when the instrument rests on a horizontal surface the bubble takes up a central position.

Spirit levels for measuring the departure of a surface from the vertical, as in building a wall or setting uprights, have a spirit tube and bubble in the top of the wooden holder fixed at right

angles to its length, and perform the same functions as a plumb line. Levels used in engineering workshops are mounted in metal; at each end of the spirit tube is an adjusting screw to compensate for the bubble going out of true owing to unequal wear on the base mounting.

In surveying, a specially sensitive spirit level is fixed on a telescope which can be revolved about a vertical axis. In use, the instrument is mounted on a tripod and is adjusted by thumbscrews fitted in its base until the bubble remains stationary during a complete rotation. Then, by sighting a hairline on lens or diaphragm on a vertically held measuring staff, any differences in the level of the ground can be measured.

In mining, a level is a horizontal tunnel or gallery which is driven from the shaft.

to put everyone on the same level, and their desires for democratic reforms and toleration were put forward in the Agreement of the People.

The Levellers disliked the increasing power of Cromwell, and in Jan., 1649, their leaders were arrested for making statements declared by parliament to be treasonable. In April the Levellers in certain regiments led a mutiny. This was put down, but the party continued in existence, making fitful appearances during the Commonwealth as opponents of the existing order. The name was applied in the 18th century to those who rose against the enclosures of land in Galloway and to a secret society in Ireland. See Agreement of the People; Lilburne, John.

Leven. A loch or lake of Kinross-shire, Scotland. It is 22 m. N. by W. of Edinburgh, and has an

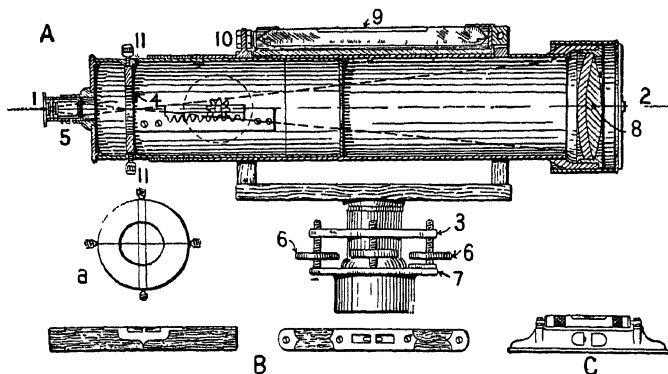


Loch Leven, Kinross-shire. The loch and Castle Island, with the ruins of the castle where Mary Queen of Scots was imprisoned

Levellers. Name applied to a party that arose in England during the Civil War. The word appears to have been first used in 1647, and the aim of its supporters was indicated by it. Levellers were found mainly among the soldiers of the parliamentary army; their leader was John Lilburne, who repudiated the name, denying that they desired

area of $5\frac{1}{2}$ m. and an extreme length of $3\frac{1}{2}$ m. It contains several islands, on one of which, Castle Island, are the ruins of a castle which was the prison of Mary Queen of Scots in 1567-68. This was built in the 13th cent., and was at times a royal residence; a causeway connects the island with the mainland. On another island, St. Serf's, are the ruins of a priory. The lake is celebrated for a species of pink trout. Formerly it covered a greater area, but the water level has fallen, partly on account of the continued erosion of the outlet, the river Leven, and partly owing to the New Cut, an artificial canal which has lowered the water by $4\frac{1}{2}$ ft. By this means a certain amount of land was reclaimed. The river Leven, which issues from the lake, is 16 m. long. There are other rivers of this name in Scotland, and there is one in Lancashire, which flows from Windermere to Morecambe Bay.

Leven. Sea loch of Scotland. It lies between Argyllshire and Inverness-shire, being an arm of Loch Linnhe, and has a length of 12 m. Its waters are used for generating electric power, and



Level. A. Instrument used in surveying: 1-2. Central horizontal axis of telescope. 3 and 7. Parallel plates with thumbscrews, 8, to level the instrument. 4. Diaphragm with cross-hairs, shown separately in a, adjusted by screws, 11. 5. Eyepiece. 6. Objective lens. 9. Spirit level on telescope with adjusting nut, 10. B. Carpenter's spirit level, side and top views. C. Spirit level with adjusting screw, used in metal work

Kinlochleven at its head has been turned into an industrial town. The river Leven, 17 m. long, flows into the head of the loch.

Leven. Police burgh and market town of Fife, Scotland. It stands at the mouth of the river Leven, on the N. side of the Firth of Forth, 11 m. N.E. of Kirkcaldy. It has a railway station. The buildings include the town hall, and the old town cross has been put up again. As a holiday resort Leven attracts many visitors, for whom there are golf links. The chief industries are flax spinning and linen making, while paper and rope are also made. There is a small dock. Pop. 7,411.

Leven, ALEXANDER LESLIE, 1st EARL OF (c. 1580–1661). A Scottish soldier. A son of George Leslie of Balquhain, he sought fortune as a soldier in the Netherlands. Later he entered the Swedish service, in which he rose to be a general. Trusted by Gustavus Adolphus, he went with him to Germany in 1630. He fought at Lutzen, and took part in the Thirty Years' War after the death of his master, being made a field marshal in 1636.

In 1638 Leslie returned to Scotland, and almost at once was selected as commander of the force raised to resist Charles I. He took the castle at Edinburgh, was responsible for the rout at Newburn, and helped to make the treaty of Ripon with the king, who in 1641, the hostility between them having then diminished, created him earl of Leven. As lord general he took a force to Ireland to avenge the massacre in Ulster, and in 1643, in consequence of the arrangement made between the Scots and the English parliamentarians, led an army into England. This army fought at Marston Moor, and Leven remained in England, but his age soon made his command only nominal. He was once again commander-in-chief when Cromwell invaded Scotland, but the actual direction of the force defeated at Dunbar was with David Leslie. In 1651 the earl was taken prisoner by the English. He died at his Fife residence, Balgonie, April 4, 1661.

Leven and Melville, EARL OF. Scottish titles held by the family of Leslie-Melville. In the 15th

century, or earlier, the family of Melville was settled at Kerth in Fife. Sir John, put to death in 1548, left a son Robert who about 1616 was made Lord Melville, as a reward for his services to James I and Mary Queen of Scots. George, the 4th lord, plotted against Charles II, and became friendly with William of Orange. In 1689 he was made secretary of state for Scotland, and in 1690 earl of Melville. His son David, the 2nd earl, was commander-in-chief in Scotland under Queen Anne. Before he died in 1728 he had inherited also the earldom of Leven.

The first earl of Leven was Alexander Leslie (*v.s.*), created 1641. The title passed to his grandson Alexander and after the latter's death in 1664 to his two daughters in turn. The younger countess died in 1682, when there was a dispute over the succession. The earldom was secured by David Melville, a great-grandson of the 1st earl, who became on his father's death in 1707 also earl of Melville. Since then the two titles have remained united. In 1947 Alexander Leslie-Melville (b. 1924) became 14th earl of Leven and 13th earl of Melville. The estates are mainly in Fife.

Levens Hall. A country house in Westmorland, one of the finest in England. There was a house here in the 12th century or earlier, but the present mansion was built by Sir James Bellingham, in the 16th century. Its carved oak chimney-pieces, panelled rooms, tapestry, and furniture are famous, and the entrance hall is one of the most perfect Elizabethan rooms in existence. The gardens are remarkable for their size and beauty. From the Bellinghams the estate passed to the Grahams and later by descent to Robin Bagot.

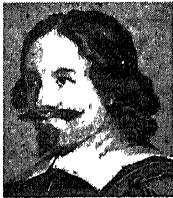
Levenshulme. District of Manchester, England. It is 3 m. S.E. of the centre of the city of Manchester, with which, and with Stockport, it is connected by regular bus services and by railway. S. Peter's, a modern Gothic building, is the chief church. Levenshulme is a busy industrial area, and has, among other activities, bleach works and calico-printing factories. Population 19,869.

Lever (Fr. *leveur*, Lat. *levator*, lifter). One of the fundamental simple machines. It consists of a rigid bar pivoted at one point called the fulcrum, and acted on at two other points by forces which tend to cause the bar to rotate in opposite directions about the fulcrum. The force which the lever is used to overcome is called the weight; the remaining force is known as the effort.

Levers are said to be of three orders, according to the distribution of the fulcrum, the weight, and the effort.

In a lever of the first order the fulcrum is between the effort and the weight, *e.g.* a sec-saw. In a lever of the second order the weight is between the fulcrum and the effort, *e.g.* a crowbar when lifting. In a lever of the third order the effort is between the fulcrum and the weight, and acts at a mechanical disadvantage, *e.g.* the forearm moving about the elbow joint.

The principle of the lever, first demonstrated in terms of weights by Archimedes, may be stated as follows: Two forces acting on a lever will balance when their moments about the fulcrum are equal and opposite, the moment of a force about a point being the product of the force by the perpendicular distance of the point from the line of action of the force. *See* Mechanics.



Alexander Leslie,
1st Earl of Leven
After Van Dyck



Levens Hall, Westmorland. The Tudor house, famous for its perfect examples of Elizabethan work

Lever, CHARLES (1806–1872). A British novelist. Born in Dublin of English descent, Aug. 31, 1806, he was educated at Trinity College there. He studied medicine at Gottingen, and practised at Portstewart, where his lively habits caused displeasure: losing money at cards, he endeavoured to recoup by contributing to the Dublin University Magazine. In 1837 what is regarded by many as the best of all his novels, *Harry Lorrequer*, began serially in its pages. This was followed by

Charles O'Malley, 1841, and Jack Hinton, 1843. Lever edited the *Magazine*, 1842-45. In 1867 he



Charles Lever

became British consul at Trieste, where he died, June 1, 1872. Among others of his numerous novels are *Tom Burke of Ours*, 1843, *Con Cregan*, 1849, and *The Martins of Cro-Martin*, 1856. The predominant note is vivacity combined with rollicking humour. Lever's characters often verge on caricature, and he has been blamed for giving a false idea of Irish life. A complete edition was issued by his daughter in 1897-99.

Leveret. The name by which a hare is known in its first year. Born covered with hair and with eyes open, it is suckled for a month, after which it is able to look after itself. Its mature condition when so young has developed from the fact that it lives in the open and must be ready to run or hide at the doe's command.

Leverhulme, WILLIAM HESKETH LEVER, 1ST VISCOUNT (1851-1925). British manufacturer.

Born at Bolton, on Sept. 19, 1851, Lever was educated there, and at 16 years joined his father in a grocery business. His soap-making business, started in 1886, increased enormously; its wares became known all over the world, and it controlled subsidiaries, had big interests in Africa and elsewhere, and as Lever Bros. was a limited company. Its headquarters were at Wigan and Warrington until a new town, Port Sunlight, was built for its activities. Lever had interests in politics and the theatre, was an advocate of a six-hour working day and of decimal coinage. He launched a scheme of co-partnership with his employees. He was also a leading Nonconformist. Liberal M.P. for Wirral, 1906-10, in 1911 he was made a baronet and in 1917 a peer, combining the name Lever with Hulme, his wife's maiden name. In 1918 he purchased the island of Lewis (*q.v.*) to develop its industries. He was



Viscount Leverhulme,
British manufacturer
Russell

made viscount 1922 and died May 7, 1925. The 3rd viscount, Philip (b. 1915), succeeded in 1949.

Leverrier, URBAIN JEAN JOSEPH (1811-77). A French astronomer. Born at St. Lô, Normandy, March 11, 1811, and educated at the *École Polytechnique*, he became professor of astronomy there in 1837. In 1839 he contributed papers on the stability of the solar system to the *Academy of Sciences*, followed by his *Tables de Mercure*, 1843, which resulted in election to the *Academy* in 1846.

Asked that year to investigate the irregularities in the movements of the planet Uranus, as a result of a brilliant mathematical performance Leverrier predicted the position of an unknown planet, and from his calculations Neptune was discovered by Galle of Berlin on Sept. 23. The same work was carried out almost simultaneously by John Couch Adams (*q.v.*), who shares the honour with the French astronomer. Leverrier was given the grand cross of the legion of honour and appointed professor of astronomy to the faculty of sciences, Paris. In 1854 he became director of the Paris Observatory, an appointment he held, save during 1870-73, till his death, Sept. 23, 1877. *See Neptune.*

Leventin, OSCAR IVAR (1862-1906). Swedish author, poet, and critic. Born July, 1862, of Jewish parents, he was made professor of literature at the Stockholm high school, 1894. He published several important works on subjects connected with Swedish and French art and literature. Among them are a book of poems, *Legends and Songs*, 1891; *King Solomon and Morolf*, 1905; and several collections of stories, including *Rococo Stories*, 1899.

Leveson Gower. Family name of the duke of Sutherland and of Earl Granville. In 1746 John Leveson Gower, who had lands in Yorkshire and Staffordshire, was made Earl Gower. He was descended from Sir John Gower, a Yorkshire landowner, who had been made a baronet in 1620. The family had long had a seat at Stittenham, near Malton, one member being John Gower, the poet. From Sir John both families are descended. *See Granville,*

2nd Earl; Sutherland, Duke of. Henry Dudley Gresham Leveson Gower (b. May 8, 1873) was a famous amateur cricketer who raised teams to play abroad. *Pron. Lewson Gore.*

Levi. Third son of Jacob and Leah. With Simeon he massacred the Shechemites in revenge for an injury to his sister Dinah. He had three sons when he emigrated with Jacob to Egypt. His descendants were the Levites (*q.v.*).

Leviathan. In ancient Jewish belief, monster inhabiting the water. The name is probably derived from Heb. *livah*, to twist. The Septuagint generally renders it dragon, and there may be a connexion with the serpent of Babylonian mythology. In Job 41, the crocodile is described under this name, but in Isa. 27, Leviathan is a serpent. The word is used figuratively of things of monstrous size.

Leviathan. A former Atlantic liner. Completed at Hamburg in 1914 for the Hamburg-America Line as the *Vaterland*, she had a gross tonnage of 54,282 on a length of 907 ft., and a speed of 24 knots, being the world's largest ship. In New York harbour when the First Great War started, she remained there until 1917 when she was taken over by the U.S.A. as a transport and renamed *Leviathan*. In 1922 she was bought by the U.S. Lines and named *President Harding*. Proving uneconomic to operate, she was laid up, and in 1939 was sold to a Belgian company who called her *Ville de Bruges*. On her maiden voyage under the Belgian flag she was sunk off the Schelde, Feb. 1940, by a German submarine.

In 1945 a light fleet carrier was launched as the *Leviathan* for the Royal Navy. Displacing 18,000 tons when fully loaded, she is 630 ft. long and 112 ft. in the beam. Engines of 40,000 h.p. give a speed of 25 knots. She is armed with 34 A.A. guns, accommodates 44 aircraft, and carries a crew of 1,400.

Leviathan. Work by Thomas Hobbes. Published in 1651, it is devoted to an exposition of the author's political philosophy. The full title is *Leviathan, or the Matter, Form and Power of a Commonwealth, Ecclesiastical and Civil*. The name indicates Hobbes's conception of the state as a great monster composed of men. Mankind, he declares, existed originally in a condition of anarchy, in which the life of man was "solitary, poor, nasty, brutish, and short." For their mutual protection individuals formed the state,



Urbain Leverrier,
French astronomer

in which individual rights were surrendered to a sovereign power, not necessarily one man, to be exercised for the common weal, and such sovereignty once conferred could not be revoked. The theory is vitiated by the fact that it is unhistorical; nevertheless, it exercised enormous though negative influence upon subsequent thinkers, especially Rousseau. The heterodox spirit of the book brought Hobbes into disgrace with the royalists, though he wrote it in their defence. *See* Hobbes, T.; State.

Levirate (Latin *levir*, husband's brother). The obligation to marry a brother's widow. This custom, which among some tribes has legal force, is found among Hindus, Polynesians, Papuans, Negroes, American Indians, and others. It was customary in Israel, and is alluded to in Ruth 1, and Matt. 22. Deut. 25, vv. 5-10, ordains it where there is no heir, though the widow is entitled to refuse. The Holiness Code (Lev. 18, v. 16) forbids the practice. The levirate has been variously explained as a law of inheritance, the wife being a chattel; as a relic of earlier polyandry, as due to the necessity of leaving an heir, the son of the second husband being assigned to the first; and as a means of preventing the division of property. *See* Marriage; *consult* History of Human Marriage, E. Westermarck, 1894.

Levis. Town of Quebec, Canada. It stands S. of the St. Lawrence, opposite Quebec, on the C.N.R. and the Quebec Central rly., and steam ferries connect it with the capital. Its industries include shipbuilding and the making of boots and cigars. A dry dock is 1,150 ft. long. From fortifications here Quebec was bombarded by the English during the siege of 1759. Pop. 11,991.

Levitation (Lat. *levitas*, lightness). Term for the rising and floating in the air of heavy bodies. According to tradition, saints and holy men, Christian and other, have been lifted up and suspended above the ground during religious contemplation. Levitation of objects has been a feature of the spiritualist seances of many so-called mediums. Where not due to deliberate trickery, explanation of them has been sought in the unconscious exercise of muscular power by persons assisting at the experiments, or in the existence of a natural force, such as that named *odyle* by Reichenbach, who in 1845 claimed to have discov-

ered it and declared it to be present in all bodies, but specially developed in sensitive subjects. Levitation has been the subject of scientific study, quickened and intensified by the discovery of such radiations as Hertz's electromagnetic waves, Becquerel rays, and X-rays. *See* Home, D. D.; Spiritualism; Yoga.

Levites. One of the twelve tribes of Israel, forming a sacred caste. Traditionally descended from Levi (*q.v.*), they acted as assistants to the priests in both the Tabernacle and Temple, had the general charge of the Tabernacle, and moved it about during the journeyings of the Israelites; and in the Temple they acted as the singers, kept the doors, and slaughtered animals for sacrifice. They had no distinct territory, but 48 cities were allotted to them, and they received tithes and alms from the people. Foreign slaves were given them for the more menial tasks connected with the Temple.

Leviticus. Third book of the Pentateuch and of the Bible. The title, taken from the Septuagint, means "That which concerns the Levites." Leviticus deals entirely with the priests, or with legal and ceremonial institutions, and has been denominated by scholars, with the inclusion of certain sections in Exodus and Numbers, the Priestly Code. The book may be divided into five parts: (1) Sacrifices, and the duties and privileges of the priests, chaps. 1-7; (2) Consecration of the priests, 8-10; (3) Clean and Unclean, and the Day of Atonement, 11-16; (4) Holiness, 17-26; (5) Vows and Tithes, 27. Part (4), the Law of Holiness, seems to be based on an independent body of priestly legislation. *See* Hexateuch; Old Testament.

Levuka. Seaport and airport of the Fiji Is. On the E. of Ovalau, it is the only settlement of any size on that small island, but it became of strategic consequence in the Second Great War as a Pacific air staging point.

Levulose, LAEVULOSE, OR FRUIT SUGAR. Sugar which occurs in honey and many fruits. Sweeter than cane sugar and not readily crystallisable, it is produced, with an equal amount of dextrose, when cane sugar is inverted by heating a solution of sugar with a dilute acid. The levulose is separated from the dextrose by treating the mixture with slaked lime, pressing to remove the calcium dextrosate, suspending the residue in water, and passing carbonic acid gas

through the liquid. The levulose remains in solution and is obtained by evaporation. Levulose (Lat. *laevus*, left) is so called because it rotates the plane of polarisation of light to the left. *See* Sugar.

Levy (Fr. *lever*, to raise). Word used in several related senses. The raising of money is sometimes called a levy, *e.g.* a capital levy. Another use is for the raising of men in time of war, *e.g.* *levée en masse*. *See* Capital Levy; Compulsory Military Service; Conscription; *Levée en Masse*.

Levy, JOSEPH MOSES (1812-88). British newspaper proprietor. Born in London, Dec. 15, 1812, and educated at Bruce Castle school and in Germany, he became a master printer in Shoe Lane, Fleet Street. There he published the Sunday Times, in which he



Joseph M. Levy, newspaper proprietor

acquired a chief share. In 1855, taking over from Col. Sleight the Daily Telegraph and Courier, after it had run for three months at a loss, he issued it as a daily newspaper at a penny—the first penny paper in London. He died at Ramsgate, Oct. 12, 1888. His son became the 1st Baron Burnham (*q.v.*). *See* Daily Telegraph, The.

Lewald, FANNY (1811-89). A German writer. She was born at Königsberg (Kaliningrad), on March 24, 1811, of Jewish parentage, but embraced Christianity. After travelling in France, Italy, England, and Switzerland, she settled in 1845 in Berlin, where in 1854 she married Adolf Stahr. She died at Dresden, Aug. 5, 1889. She is notable as the first German woman to champion the emancipation of her sex. She wrote of her travels in England and Scotland, 1851-52; The Story of My Life, 1861-63; and novels, From Generation to Generation, 1863-65; Benedikt, 1874; Benvenuto, 1876; Stella, Eng. trans. 1884.

Lewanika. A chief of the Barotse tribe. After a period of great unrest he succeeded to the chieftainship in 1877, changing his original name of Lobosi to Lewanika in 1885. Ten years of strife and of incessant struggles against would-be usurpers were followed by a period of calm, largely due to the influence of the missionary Collard, and in 1890 Lewanika entered into relations with the British South Africa

Company, and placed himself under the protection of the U.K. The country was then opened up to trade. Lewanika came to England for the coronation of Edward VII.

Lewes. A mun. borough and market town of E. Sussex, also the county town. It stands on the Ouse, 50 m. S. of London and 7 m. N.E. of Brighton, and has a railway station. The keep and gateways of its Norman castle were presented to the nation in 1920. There is a small museum herein, and another in the Barbican House. There are several old churches, S. Anne's, S. Thomas-at-Cliffe, S. Michael's, and S. John's, the last-named in the part of the town known as South-



Lewes arms



Lewes. Ruins of the Norman castle, which were presented to the nation in 1920. Top right, the steep High Street of the county town of East Sussex

over, and a 16th cent. grammar school. More modern are the town and county halls, the gaol, public library, and corn exchange. About 2 m. away is a racecourse.

Standing just where the Ouse cuts its way through the Downs, Lewes existed in Anglo-Saxon times and was a borough at the time of Domesday. Its castle was the residence of the Warenne family and then of the earls of Arundel. It was a centre of the wool trade and had a merchant guild. Lewes, which had its own M.P. 1295-1885, gives its name to a co. constituency. From about 1600 to 1800 it was governed by a fellowship, the existing corporation dating from 1881. Pop. 13,884.

Lewes, BATTLE OF. Fought on May 14, 1264, between the troops of Henry III and those of the insurgent barons under Simon de Montfort (*q.v.*). The royalists, with whom were some Welsh, marched plundering through Kent and Sussex, from Rochester to Lewes, and to encounter them Montfort left London with a motley army. On

May 13 this encamped at Fletching, 9 m. N. of Lewes. Next day Montfort led his men in battle array towards the town. They were in two main divisions, Montfort's own standard being deliberately placed with the weaker one, while he himself was on the right with the stronger. At their approach the royalists, under the leadership of Edward, afterwards Edward I,

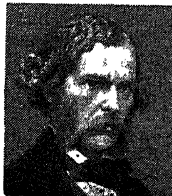


dashed out of the town, and drove the Londoners on the left before them.

Meanwhile, de Montfort's knights were winning the victory, for the remaining royalists could not stand against them. King Henry was made prisoner and the town was occupied; the concluding stages of the battle were being fought in its streets

when Edward and his followers returned. Edward took refuge in a church, and while many of the knights made their escape, the humbler followers were killed or drowned while crossing the Ouse.

Lewes, GEORGE HENRY (1817-78). British philosopher, critic, and miscellaneous writer. He was born in London, April 18, 1817, and studied medicine, but had to give it up owing to his sensitiveness. He lived two years in Germany, drifted into journalism, and made



solid contributions to the literature of science and philosophy. He was the editor of *The Leader*, 1851-54, and founded *The Fortnightly Review* in 1863. In 1854 he left his wife and formed a connexion with Mary Ann Evans (*George Eliot*), whose mental deve-

lopment owed much to Lewes's sympathy and understanding. The two lived together as husband and wife until his death, Nov. 28, 1878. Lewes's works include *Biographical History of Philosophy*, 1845; *Comte's Philosophy of the Sciences*, 1853; a standard *Life of Goethe*, 1855; *Physiology of Common Life*, 1859-60; *Problems of Life and Mind*, 1878. See *Eliot, George*.

Lewis. N. part of the most northerly and largest island of the Outer Hebrides, Scotland. The S. part is known as Harris and the whole Lewis - with Harris. It is separated from the mainland, 24 m. away, by the Minch. Lewis proper is 683 sq. m. in area and

belongs to the county of Ross and Cromarty; Harris (176 sq. m.) belongs to Inverness-shire. Lewis has an extreme length of 66 m. and an extreme width of 29 m.

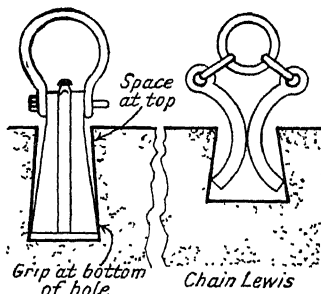
The island is hilly in Harris and in the S.E., where Ben Mhor rises, 1,750 ft., but most of Lewis is fairly flat and largely covered with moor, while there are many lakes. The coast is rocky and deeply indented by several sea lochs. The Butt of Lewis, a promontory in the N., rises to 145 ft. On the E. is the little peninsula of Rye. The only town is Stornoway, on the E. coast of Lewis. A number of islands including the Shiant Islands belong to Lewis. The main industries are cattle and sheep rearing and fishing. Barley, oats, and potatoes are grown, and an experimental farm is conducted by the Macaulay institute for soil research, but the island is found to be infertile. Peat is abundant.

In 1844 Sir J. Matheson purchased the island for £190,000 and spent large sums in improving it, but the results were hardly adequate to the outlay. In 1918-19 Lord Leverhulme bought Lewis and part of Harris to develop their industries by introducing modern methods. There were differences between the new proprietor and the board of agriculture over the development policy, also some agrarian troubles, and after his death in 1925 it was sold.

The island belonged to the MacLeods and later to the MacKenzie. At Rodal there are remains of a monastery, dating from Norman times, and its church was

the burial place of the MacLeods. At Callernish are several stone circles. Pop. approx. 30,000. See Harris. *Pron. Lewis.*

Lewis. Lifting device for hoisting blocks of stone into position for erection. It depends for its holding



Lewis. Diagram of this lifting device. Right, the chain lewis

power upon the grip exerted by two dovetailed members in a correspondingly shaped hole cut in the stone block. The lewis consists of three steel members fixed together by a shackle and pin so that, on withdrawal of the pin, it can be dismantled. Another form, a chain lewis, comprises two curved legs held by links to a hoisting ring; the drag of the weight being lifted holds the legs against the sides of the hole in the block.

Lewis, CECIL DAY (b. 1904). British poet. Born April 27, 1904, he was educated at Sherborne and Wadham College, Oxford, and was for eight years a schoolmaster (Cheltenham College, 1930–35). During the Second Great War he worked with the ministry of Information. Collected Poems, 1929–33, made his reputation as a lyric writer who, while up-to-date in his vocabulary, even to slang, was faithful to old forms; who was disillusioned but avoided the despair of the "advanced" school. Day Lewis then wrote *A Time to Dance*; *A Hope for Poetry*; with Charles Fenby, an entertaining *Anatomy of Oxford*; *Poetry for You*; and translated Virgil's *Georgics*.

Cecil Day Lewis,
British poet

Lewis, CLIVE STAPLES (b. 1898). British writer, born Nov. 29, 1898. A mostly private education was followed by a brilliant career at University College, Oxford, ending with a lectureship; then from 1925 he was tutor at Magdalen College. In his best-known work, *The*

Screwtape Letters, 1942, he presented Christian ethics in the form of a witty and entertaining allegory. *The Allegory of Love*, 1933; *The Problem of Pain*, 1940; *Christian Behaviour*, 1943; *The Great Divorce*, 1945; *Miracles*, 1947, were highly acceptable as Anglican apologetics though offered by a layman.

Lewis, DOMINIC BEVAN WYNDHAM (b. 1891). British writer. The original "Beachcomber" of the *Daily Express*, he delighted many with his daily column of crazy characters and whimsical comment, later contributing similar causeries successively to the *Daily Mail* and (as Timothy Shy) to the *News Chronicle*. For a period in the early 1930s he also wrote the *Mustard and Cress* column in the *Referee*. He had successes with *A London Farrago*, 1922; *At the Green Goose*, 1923; *At the Sign of the Blue Moon*, 1924; *The Nonsensibus*, an anthology, 1936; *Take it to Bed*, 1944; and compiled *The Stuffed Owl*, an anthology of bad verse. In serious vein he published some historical works, *François Villon*, 1928; *King Spider* (Louis XI), 1930; *Emperor of the West* (Charles V), 1932; *Ronsard*, 1944.

Lewis, EDWARD MORLAND (1903–43). Welsh painter. Born at Carmarthen, May 25, 1903, he studied art at the R.A. school where he came under the influence of Sickert. He made his reputation as a landscape painter whose mastery of tones was perhaps the distinctive feature of his work. His Welsh scenes and London perspectives contributed something of permanent value to modern British painting. Lewis was a member of the London Group. As a camouflage officer he went to N. Africa, where he died Aug. 4, 1943. A memorial exhibition was held at the Leicester Galleries in 1944.

Lewis, SIR GEORGE CORNEWALL (1806–63). British politician and author. Born in London, the son of a Radnorshire landowner, he was educated at Eton and Christ Church, Oxford, and became a barrister. In 1838 he succeeded his father as a poor law commissioner. In 1847 he was elected for Herefordshire as Liberal M.P., and was made secretary of the board of control. Later he was under-secretary for home affairs, going on to the Treasury as financial secre-



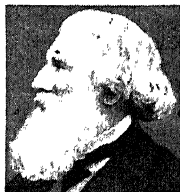
Sir G. Cornwall Lewis,
British politician

tary. He lost his seat in 1852, but was elected in 1855 for Radnor boroughs, and became chancellor of the exchequer. Home Secretary in 1859, he was war secretary from 1861 until his death, April 13, 1863.

His books include *Remarks on the Use and Abuse of Political Terms*, 1832; *Essay on the Origin and Formation of the Romance Languages*, 1835; *Essay on the Government of Dependencies*, 1841. He edited the *Edinburgh Review*, 1852–55. His baronetcy, inherited 1855, passed to his brother. *Consul Letters*, ed. G. F. Lewis, 1870.

Lewis, SIR GEORGE HENRY (1833–1911). A British solicitor. Born in London of Jewish parents, April 21, 1833, he was educated at University College. He became a solicitor and, specialising in criminal cases, won recognition in the prosecution of Overend and Gurney, bankers. Head of the firm of Lewis and Lewis, he was consulted in nearly all important cases of libel and scandal involving persons of standing in society, and was said to know more secrets than any other man in London. Created a knight in 1893 and a baronet in 1902, he died Dec. 7, 1911.

Lewis, JOHN FREDERICK (1805–76). A British painter. Born in London, son of Frederick Christian Lewis, an engraver, he studied under his father. He began his career by painting and exhibiting animal pictures, the subjects being studied at the menagerie in Exeter 'Change; but after a visit to Spain (1832–34) he confined himself so closely to Spanish subjects as to earn the title of Spanish Lewis. He passed eight years in Asia Minor and Egypt, and returned to England in 1851; then discontinued water-colour painting in favour of oils, and was elected A.R.A., 1859, and R.A., 1865. He died Aug. 15, 1876.



John F. Lewis,
British painter

Lewis, JOHN LLEWELLYN (b. 1880). American labour leader. Son of a Welsh coal miner, he was born in Lucas, Iowa, Feb. 12, 1880, and worked in the pits. Legislative agent for the united mine workers of Illinois, 1908–11, and organizer for the American Federation of Labour, 1911–17, he became president of the United Mine Workers union in 1920, and in 1935 formed the committee for industrial organizations, later the Congress of

Industrial Organizations (*q.v.*). Lewis supported Roosevelt for president in 1936, but gave aid to Willkie in 1940, resigning from the C.I.O. on his defeat. He retained the presidency of the U.M.W., and when in 1946 the union was readmitted to the A.F. of L., Lewis became vice-president of the latter.

As virtual dictator of the U.M.W., Lewis led a strike in 26 states April-May, 1946, to end which the govt. took over control of bituminous coal mines. Six months later, he defied the govt. and called the miners out again, Nov. 20. Committed for contempt of court, he was fined £2,500, the union being fined £875,000 (reduced by the supreme court to £175,000). He then ordered the miners back to work, bringing them out April 1-6, 1947, for a "memorial week" after 111 miners had been killed in a mine disaster near Centralia, Illinois. In spite of the Labour Act passed in June, which greatly limited the powers of trade unions, he succeeded in negotiating with the mine owners an agreement embodying wage increases before the mines were returned to private control in July.

Lewis, MATTHEW GREGORY (1775-1818). English author. Born in London, July 9, 1775, he was educated at Westminster, Christ Church, Oxford, and Weimar. He was attaché to the British legation at The Hague, 1794; and M.P. for Hindon, Wilts, 1796-1802. He inherited estates in Jamaica, where he sympathised with the slaves, died of yellow fever in the Gulf of Florida, May 13, 1818, and was buried at sea. Known as "Monk" Lewis, from his unpleasant romance, *Ambrosio*, or *The Monk*, 1795, he wrote ballads, including *Alonzo the Brave*, setting some to music; melodramas, including *The Castle Spectre*, 1798; translated *The Bravo of Venice* from the German, 1804; and was author of a valuable *Journal of a West Indian Proprietor*, 1834. *Consult* *Life and Correspondence*, 1839.

Lewis (PERCY) WYNDHAM (b. 1884). British painter and writer. Born in Maine, U.S.A., he was educated at Rugby and the Slade School. As a painter he came into prominence as the chief exponent of Vorticism, an art movement based on Cubism (*q.v.*). His compositions of inhuman figures with cast-iron countenances symbolised mass-production and a machine-ruled world. Portraits of Edith Sitwell (in the Tate Gallery) and T. S. Eliot were well known.

He attracted attention when he founded and edited *Blast*, a short-lived literary magazine, highly unorthodox in content, typography, and format, shortly before the First Great War, and established his reputation as a satirist with *Tarr*, 1918, a study of student life in Paris. *The Apes of God*, 1930, was a biting satire on post-war London. He also wrote *Filibusters in Barbary*, 1932; *Men without Art*, 1934; *Count your Dead*, 1937; *Blasting and Bombardiering*, 1937; *The Hitler Cult*, 1939.

Lewis, SINCLAIR (b. 1885). An American novelist. Born at Sauk Centre, Minn., Feb. 7, 1885, and educated at Yale, he published his first novel, *Our Mr. Wrenn*, in 1914, but it was only with the fourth, *Main Street*, a powerful indictment of provincial American society, that he became recognized in 1920 as a potent force in literature. His writing had immense vitality, and for the most part his scenes were of the Middle West. Mordant and intensely critical, Lewis attacked his countrymen's perfunctory morality and sentimentality. His next novel, *Babbitt* (*q.v.*), 1922, consolidated his position and added a new word to the American language, descriptive of the complacent business man, without vision, and intellectually stagnant. *Martin Arrowsmith*, 1924, the story of the medical career of a robust idealist, brought an offer of the Pulitzer prize, which was refused. *Elmer Gantry*, 1927, drew a satirical picture of the professional revivalist. In 1930 Lewis was awarded the Nobel prize for literature.

All his novels showed an equally strong sense of realism, incisive character drawing, and pictorial detail. Other important ones were *The Man who Knew Coolidge*, 1928; *Dodsworth*, 1929; *Ann Vickers*, 1933; *It Can't Happen Here* (a warning that fascism could happen in the U.S.A.), 1935; *The Prodigal*

Parents, 1938; *Gideon Planish*, 1943; *Kingsblood Royal*, 1948. Lewis himself dramatised *Dodsworth* and *It Can't Happen Here*, 1938. Film versions were made of *Dodsworth* and *Martin Arrowsmith*.

Lewis Bolt. Anchoring bolt having a half-dovetail formed on the lower end. This end is inserted into a similarly shaped hole in masonry, wide enough to allow a little play and permit the wide end of the bolt to enter. The play is taken up, and the dovetail forced against the side of the hole by a steel plug or feather driven in on the straight side of the bolt between the latter and the side of the hole.

Lewis Gun. Automatic weapon firing rifle ammunition of .303 or .300 calibre. It is automatically operated by the pressure of the gas resultant upon discharge of the cartridge, assisted by a return spring: rounds are removed from the magazine, placed in the breech, fired, and the empty case withdrawn in four consecutive and automatic operations. The gun was invented by Col. Isaac Lewis (1858-1931) of the U.S. army shortly before the First Great War, and first manufactured in the U.K. in 1915 by a refugee Belgian firm at the Birmingham Small Arms factory. Originally fitted with a rifle butt and grip, it was primarily issued as an infantry weapon, but later developed for aircraft. *See* *Machine-Gun*.

Lewisham. Bor. of the co. of London. Third in size of the met. bors., it lies S.E. of Camberwell and Deptford, W. of Greenwich and Woolwich, and is bordered S. by Kent. It covers an area of about 11 sq. m., comprises the parishes of Lewisham and Lee (*q.v.*), and is divided into 15 wards, containing Bellingham, Blackheath, Brockley, Catford, Downham, Forest Hill, Honor Oak, Ladywell, and Sydenham. Two M.P.s were elected up to 1945; a third member was allotted in the redistri-



Sinclair Lewis,
American novelist



Lewisham, London, S.E. The High Road, showing the clock tower, a well-known local landmark

bution of 1948. Lewisham is served by railway and by trams, buses, and Green Line. In addition to the church-like town hall at Catford, 1874 (new buildings, 1932), the chief edifices include the church of S. Mary, 1774, with a 16th century brass and ancient belfry; central library, 1901; grammar school, founded by the Rev. Abraham Colfe, or Calf, vicar of Lewisham 1610-57; Colfe almshouses; S. Dunstan's College, opened 1888; and public baths. Lewisham is almost entirely residential. In the Second Great War it suffered in the early bombing of London, notably on Sept. 7 and 11, 1940. On Jan. 20, 1943, a German aircraft flying low dropped a bomb on an L.C.C. school at Sandhurst Road, Catford, killing 6 teachers and 42 children. On July 28, 1944, when a flying bomb fell in Lewisham High Street, 56 lives were lost. The manor, the history of which goes back to Saxon times, has belonged since early in the 18th century to the earl of Dartmouth. Pop. est. 208,370. *Consult* History of the Borough, L. L. Duncan, 1908.

Lewisian Rocks. In geology, a group of ancient rocks of Pre-Cambrian age, occurring in N.W. Scotland also in the Hebrides, named after the island of Lewis. The group consists of granites, gneisses, and basic rocks of more than one age. The gneisses are generally referred to as of igneous origin, but metamorphosed sediments have been recognized at Loch Marce (Ross-shire) and on Lewis-with-Harris. The E. boundary of the group is the line of the Moine Thrust (*q.v.*) from Loch Hope to the Sound of Iona, but isolated areas of Lewisian gneisses occur further E. *See* Pre-Cambrian.

Lewiston. A city of Maine, U.S.A., in Androscoggin co. On the Androscoggin river, here crossed by several bridges, it is 35 m. N. of Portland, and is served by the Grand Trunk and Maine Central rlys. Bates College is here. On Lake Auburn, 3 m. distant, is the state fish hatchery. Settled in 1770, Lewiston was incorporated in 1795 and became a city in 1861. Pop. 38,598.

Lewis - with - Harris. This Hebridean Is. is described under its parts, Lewis and Harris.

Lexicon. *See* Dictionary.

Lexington. City of Kentucky, U.S.A., the co. seat of Fayette co. It is 80 m. S. of Cincinnati, on the Chesapeake and Ohio and other rlys. The centre of the blue-grass region, it is famous for the breeding of light thoroughbred

horses, is a market for loose-leaf, "light-curly" tobacco, and distils Kentucky Bourbon whisky. It is the seat of Transylvania university, removed hither from Harrodsburg in 1865, and of the state university. First settled in 1775, Lexington was incorporated in 1782 and became a city 50 years later. Pop. 49,304.

Lexington, BATTLE OF. First skirmish, April 19, 1775, in the War of American Independence. The village lies 11 m. N.W. of Boston, Mass. Anticipating an outbreak, the British general, Gage, sent 800 men under Col. Francis Smith to seize the stores at Concord and capture Hancock and Adams, who had been hiding at Lexington. The countryside was already alarmed, and Major Pitcairn, who had been sent in advance, encountered a body of 50 minute-men (*q.v.*), commanded by Capt. John Parker, on Lexington Common. Ordered to disperse, they were about to do so when Pitcairn's horse was hit and he was thrown. The British forces fired, though Pitcairn maintained that no order had been given. Eight Americans (to whom a memorial was raised in 1837) were killed, and the British marched on to Concord. *See* American Independence, War of.



Leycesteria formosa. Leaves and flowers of this Himalayan shrub

Lex loci (Lat., law of the place). Term used in English law in several senses. *Lex loci contractus* means that a contract is to be construed, unless the contrary appear, according to the law of the place of contract. By English law a contract not relating to land must be construed according to the law of the place of contract but by English law a contract relating to land must be construed according to the law of the country of which the land forms part. This is *lex loci rei sitae*. Thirdly, by English law all matters relating to the conduct of an action and

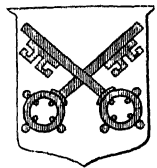
the procedure and evidence therein are to be decided by the law of the place where the action is brought. This is known as *lex fori*, or law of the forum.

Ley, ROBERT (1890-1945). German politician. Born at Niederbreidenbach, Rhineland, Feb. 15, 1890, he studied the chemical composition of food, and after the First Great War worked in the German Dye Trust's laboratories. An early member of the Nazi party, he was appointed its *Reichsleiter*, was dismissed from the dye trust in 1928, and joined Hitler in Munich, 1932. On May 2, 1933, after abolishing trade unions, he established the German labour front, and later the "Strength through Joy" movement, chiefly with confiscated capital. A drunkard and profligate, Ley toured Germany making abusive speeches, and though accused of embezzlement was maintained in office by Hitler. Head of many institutions, he was responsible with Sauckel for the enslavement of foreign workers. Captured by U.S. troops near Berchtesgaden, May 16, 1945, he was indicted as a major war criminal, but committed suicide in his cell at Nuremberg, Oct. 25. His brain is preserved at the Armed Forces Inst. of Pathology, Washington, D.C.

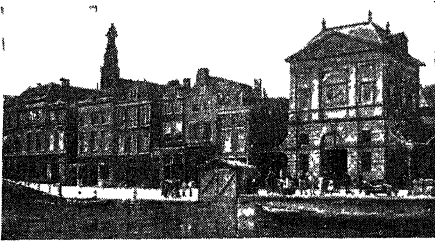
Leyburn. Town in the N. Riding of Yorkshire, England. In Wensleydale, it stands near the left bank of the Ure, 8 m. S.S.W. of Richmond, and is built of stone. A green limestone terrace to the W., known as the Shawl, gives a beautiful view of the dale. At the Queen's Gap Mary of Scots is said to have stopped during an attempted flight from Bolton Castle.

Leycesteria formosa. Shrub of the family Caprifoliaceae. It is a native of the temperate parts of the Himalayas. It has opposite lance-shaped leaves, and the white, funnel-shaped flowers are borne in sprays, with purple bracts.

Leyden. Town of the Netherlands, in the prov. of S. Holland. It lies on the Oude Rijn, the branches of which intersect the town, 9 m. N.E. of The Hague, with which there is rly. and steam tramway communication, as also with Haarlem. In character Leyden is a university town, quiet and attractive, and has few industries. There are markets for agricultural produce.



Leyden arms



Leyden. The Oude Rijn, with the Weigh House and Butter Market, and the Stadhuis before the fire of 1926

The old Raadhuis in Breestraaf, once one of the most striking works of the Dutch Renaissance, was almost completely destroyed by fire in 1926.

Notable churches are that of S. Peter, with tombs of Boerhaave, Scaliger, and other scholars, and Hooglandsche Kerk, a basilica of the 16th century, restored 1902. The municipal museum has galleries of paintings and antiquities, and the museum of antiquities, founded 1818, has a collection of antiquities, classical, Egyptian, and Dutch. There are many interesting houses, gateways, etc. Rembrandt was born here.

In the Middle Ages Leyden became a far-famed centre of the cloth trade, craftsmen from Ypres helping to give it its high place. The siege of 1573-74 lasted almost continuously for nearly 12 months, the town being relieved after inundation of the neighbourhood by William the Silent. A pestilence swept Leyden 1655. The town was captured by the French in 1793, and damaged by the explosion of a barge laden with gunpowder in 1807. It was occupied by the Germans in May, 1940, to be liberated after their surrender on May 5, 1945. Pop. 83,952.

The university was founded by William of Orange in 1575, and in a remarkably short time became a centre for scholars from all parts of Europe; among those who made its name famous were Grotius, Boerhaave, Arminius, Scaliger, and Ruhnken. It is still the chief university of the Netherlands, especially famous as a medical school. The buildings lie in the E. part of the town, and include a splendid library; close by is the botanic garden.

Leyden, JOHN (1775-1811). A Scottish Orientalist. Born at Denholm, Roxburghshire, Sept. 8, 1775, the son of a shepherd, he was educated at Edinburgh university, and helped Scott with his Border Minstrelsy. Graduating M.D. at St. Andrew, Leyden took up a medical appointment in

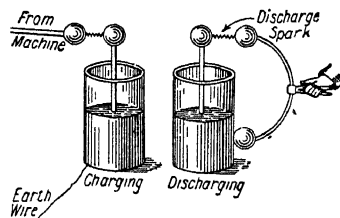
Madras in 1803. His linguistic gifts were utilised in translating the Gospels into several languages, while from 1807 he taught Hindustani at Calcutta. He died in Java, Aug. 28, 1811. His best poems are Scenes of Infancy, written before he left Scotland, and an Address to an Indian Gold Coin.

Leyden, LUCAS VAN, properly Lucas Jacobsz (1494-1533). Dutch painter and engraver. Born at Leyden, he studied painting under Cornelis Engelbrechtsen and worked at Leyden, Middelburg, and Antwerp. A large triptych by him, representing The Last Judgement, is preserved in the Leyden town hall. As an engraver, he was a pioneer in the Netherlands.



Lucas van Leyden, Dutch painter

Leyden Jar. Form of electrical condenser. It is so called because it was invented at Leyden by Cunaeus in 1746, though there are reports that Kleist evolved a similar condenser at Cammin about the same time. It consists of a wide-mouthed glass jar coated inside and out, on the bottom and halfway up the sides, with tin-foil. The rest of the surface is varnished with shellac to keep it free from moisture. An upright bar with a tripod bottom and a brass knob at the top stands in the jar. If the jar is placed on a non-insulating substance, so as to be earthed, and a high-tension current is passed into the knob from a terminal of an influence machine, electricity of the opposite polarity collects in the outside foil. The jar is discharged by applying one end of an insulated conductor to the outside and bringing the other near the knob.



Leyden Jar. Methods of charging and discharging a simple form of the apparatus

The thinner the glass, the greater the electrical capacity of the jar. But as very thin glass is easily broken and does not stand up well to the high electric field, great capacity is usually obtained by using several large jars in parallel, i.e. all knobs connected together. The jar in the form described is now chiefly of historical interest.

Leyds, WILLEM JOHANNES (1859-1940). South African politician. Born at Magelang, Java, May 1, 1859, he was educated at Amsterdam university. He then went out to the Transvaal. In 1884 he became its attorney-general, in 1888 secretary of state, and again in 1893 and 1897. He was Kruger's chief assistant in the agitation that preceded the outbreak of the S. African War in 1899. From 1898 to 1902 he was minister to the Netherlands. He died in May, 1940.

Ley Farming. A system of agriculture in which grass is a rotation crop. During the last quarter of the 19th cent., when cheap wheat from overseas had depressed agriculture in Great Britain, hundreds of thousands of acres of land in that country were sown with grass seed to make permanent pasture. But before the end of the century farmers were considering the advisability of growing grass as a ley (i.e. for a period and then ploughing it up and planting afresh with grass or some other crop) rather than as a permanent pasture, and by 1910 a few farmers were making regular use of a grass ley in their rotation of crops.

The First Great War led to the ploughing up of thousands of acres of grass land; and in 1919 the Welsh Plant Breeding Station at Aberystwyth was set up where experiments in seed selection and methods of manuring aimed at the improvement of grassland were initiated. In New Zealand and Australia also agriculturists worked on the subject. During the Second Great War ploughing up of grassland was on an even greater scale than during the First, and it became possible to make practical use on a wide scale of the knowledge about grass already available and further extended by the grassland improvement station at Dodwell, Stratford-on-Avon, established by the ministry of Agriculture and Fisheries in 1940.

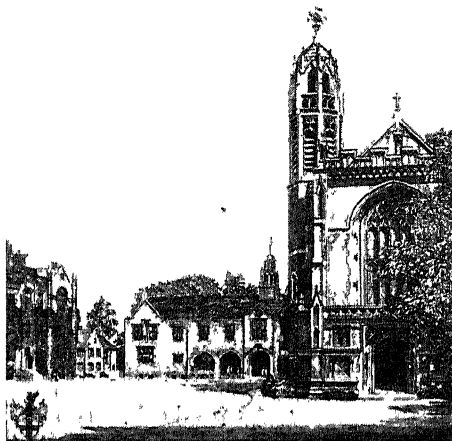
In ley farming, grass has two functions: it provides feed for livestock, and its roots ploughed

into the soil are a valuable manure for the following crop; the value of the second is greatly enhanced by the presence of roots of white clover. Different seed mixtures have been found suitable according to the type of land, intended duration of the ley (one, two, three, or more years), and the intended use of the grass (grazing, best in the first three years, or hay). They range from a mixture for a short ley of several strains each of rye grass and white clover to mixtures for longer leys of several strains of half a dozen plants. Some of the plants produce herbage before the others, whose early growth is protected by the more rapidly developing. It is important that animals should be put to pasture as soon as possible on a new ley, e.g. in the autumn on one sown in the spring; their treading consolidates the ground, their grazing causes the plants to tiller and so cover the ground more quickly, and their dung and urine help to fertilise the soil. Consult *The Plough-up Policy and Ley Farming*, Sir George Stapledon, 1939, new ed. 1946; *Ley Farming*, Stapledon and Davies, 1942; *Grassland Husbandry*, H. S. Moore, 1943.

Leyland. An urban district and industrial town of Lancashire, England. It is $4\frac{1}{2}$ m. S. of Preston, and has a junction on the main rly. line to Scotland. S. Andrew's church, rebuilt 1870, dates back to 1100 and has 16th century glass. Motor vehicles, paint, and rubber products are manufactured, while there are also mills for spinning and bleaching of cotton. Pop. 10,573.

Leyland, MAURICE (b. 1900). English cricketer, born at Harrogate, on July 20, 1900. This left-handed player first appeared for Yorkshire in 1920, and was still a mainstay of the side when he retired in 1946. Making 137 in his first test match in Australia, 1929, and helping L. Hutton in a record second-wicket partnership of 382 in 1938, he played in every series of Anglo-Australian matches between those dates. Leyland could be relied on for runs when they were difficult to obtain, bowled tricky slows, and was a brilliant fieldsman in the deep.

Leys School, THE. English public school situated at Cambridge. Founded by prominent Wesleysans



The Leys School, Cambridge. From an etching, showing the library on the right, and the gateway in the background

in 1874, it has fine modern buildings and accommodation for 260 boys. The chapel was completed in 1906. George V opened the gateway and library in 1914. Old Leysians maintain a mission in City Road, London, E.C.

Leyte. One of the Philippine Islands. A member of the Visayan group, forming with several smaller islands the province of Leyte, it is separated from Mindanao by Surigao Strait. Mountainous in the interior, the W. part is traversed by a broken range which reaches 3,935 ft. in Mt. Sacripante. Leyte is a great producer of hemp and bananas. Minerals abound, but apart from sulphur are little developed. Area of island, 2,785 sq. m.

When the Japanese captured the Philippines, Dec., 1941-May, 1942, they occupied Leyte without a major action. U.S. forces landed in the island once more on Oct. 20, 1944, after a heavy preliminary naval and air bombardment. They achieved complete surprise since, on account of Leyte's central position in the Philippines, the Japanese had considered it safe from attack. Tacloban and Dulag airfields were captured next day. These landings threatened the Japanese communications with the Nether-

lands East Indies; and three forces attempted to encircle the U.S. fleet in Leyte Gulf and to destroy their transports. During October 22-27 the Japanese navy suffered a crippling defeat, with the loss or severe damage of some 60 warships. Though the garrison of the island (Japanese 14th army) offered fanatical resistance, Leyte was cut in halves on Nov. 1, when U.S. troops reached the W. shore. Ormoc was captured on Dec. 10, after a month's fighting, Palompon, the last Japanese-held port, was stormed on December 25, and all organized resistance then ceased.

Leyton or **LOW LBYTON.** Municipal borough of Essex, England. It is situated about 5 m. N.E. of London, on the Central line and rly. from St. Pancras. Of the parish church of S. Mary, rebuilt, except the tower, in 1821, and containing some interesting brasses, John Strype, the antiquary, was nominal vicar, 1669-1737, but was never inducted; he was buried in the chancel. Etloe House, in Church Lane, built in 1760 by another antiquary, Edward Mores, founder of the Equitable Assurance Society, was for long the residence of Cardinal Wiseman, and later became a home for girls. Leyton, which is on the border of Epping Forest, has a fine town hall, 1896, and public libraries, public baths, a hospital, and pleasure grounds, including those of the Essex cricket club and Leyton Orient football club. Chiefly residential, it has some light industries, such as printing and furniture making. It is a borough constituency.

In 1926 the Leyton urban district council was granted a charter of incorporation. From about 1200 to the Dissolution the manor, which is mentioned in Domesday, belonged to the abbey of Stratford Langthorn. Evidences of Saxon and Roman occupation have been



Leyton, Essex. Leyton High Road, showing (on the right) the town hall and central public library

found. Sir Thomas Roe, the traveller, and Thomas Lodge, the dramatist, were natives. Pop. 1876, 5,500; 1931, 128,317; 1946, est. 105,880.

Leytonstone. Dist. of Greater London, part of the borough of Leyton. Formerly a hamlet, it is served by the Central line, is 10 m. by rly. N.E. of St. Pancras, and is bordered by Wanstead Flats and parts of Epping Forest. The church of S. John the Baptist dates from 1843. About $\frac{1}{2}$ m. E. is Wanstead Park, which covers 200 acres. *See* Wanstead.

Lezaky. A hamlet of Czechoslovakia, in the Chrudim industrial dist., c. 60 m. E. of Prague. It was razed to the ground and its inhabitants (about 60) scattered by the Germans, June 25, 1942, because it was said to have sheltered parachutists who plotted the attack on Reinhard Heydrich (*q.v.*). *See* Lidice.

Leze Majesty (Fr. *léser*, from Lat. *laedere*, to injure). In law, a crime coming within the category of treason committed or attempted against the sovereign or the sovereign power of a state. In the Roman criminal system, treason, *crimen laesae majestatis*, under the

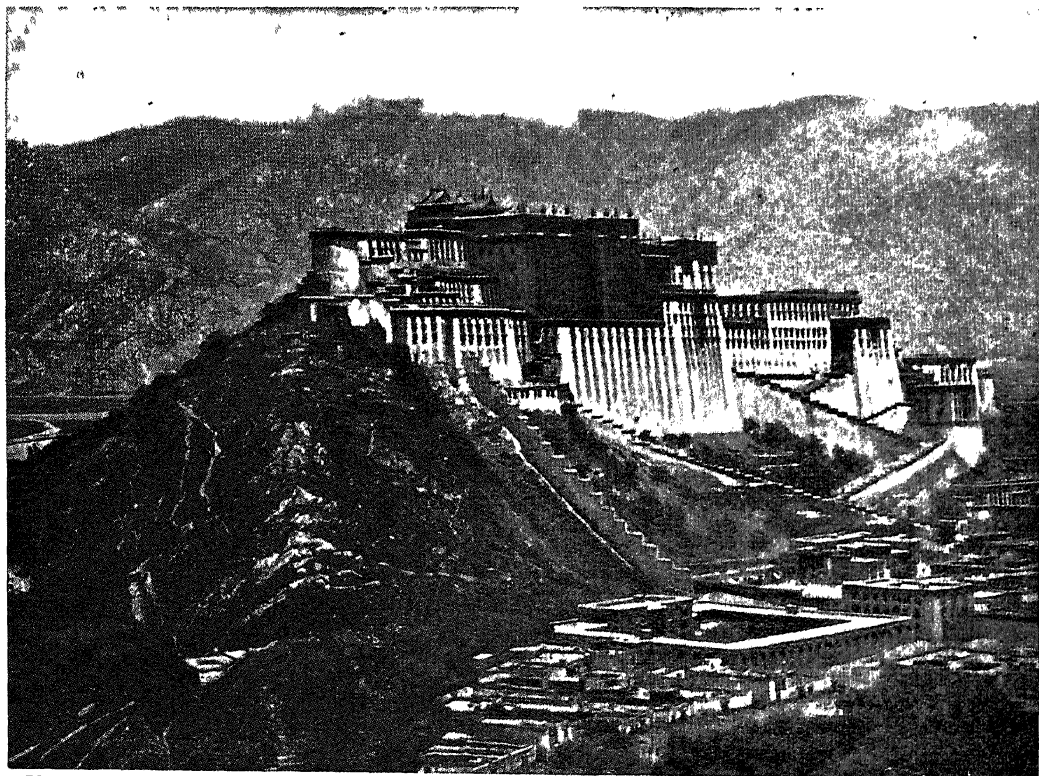
republic included any conspiracy against the government, aiming at royal power, assisting the enemies of Rome, usurpation of office, and mismanagement of military command—all offences against the sovereign power and dignity of the Roman people. Under the empire it was extended to offences against the imperial person and dignity. In the British Empire leze majesty is merged in treason, sedition, or rebellion. *See* Treason.

Lhasa. Chief city of Tibet and the seat of the Dalai Lama. It lies 11,830 ft. above sea level, in a fertile plain surrounded by barren hills. Apart from the physical difficulties of approach, Lhasa has been rendered inaccessible by a deliberate policy of isolation which seems to have been inaugurated by its Chinese conquerors in the 18th century, and which the Lamas have done little to modify. Before the British armed expedition of 1904, only one Englishman, Thos. Manning in 1811, had ever succeeded in penetrating into the Forbidden City.

A road leads S. from Lhasa 390 m. to the Himalayan town of Darjeeling, and the Ky-chu river flows $\frac{1}{2}$ m. S. of the city on its

way to join the Brahmaputra (here called the Tsangpo) 38 m. to the W. A ridge of hills screens Lhasa to the S.W., with summits to N. and S. On the N. peak stands the Potala, the Dalai Lama's palace, rising in tiers on the hillside and completely dominating the city; the S. point, rising from the river, is topped by a fort and the Lamas' medical college. Between these two hills is the gateway to the city, a mighty portal 30 yds. wide. The city walls were destroyed by Chinese invaders in 1722 and never rebuilt.

Between the gateway and the city stretches a belt of meadows, cornfields, orchards, plantations, and marshland. The city itself is 1 m. E. to W. and about $\frac{1}{2}$ m. in breadth; its pop. is estimated at 50,000. Houses are solidly built, of two or three storeys, but the streets are squalid, undrained, unpaved, and choked with filth. The Jokang (temple of Buddha), the centre of all Buddhism, stands in a square in the centre, neglected and ruinous. The poorer houses are of baked clay, but those of the richer people are of stone and brick; all are frequently white-washed, and the doors and



Lhasa, Tibet. The Potala or palace of the Dalai Lama, on a hill to the south-west of the town. The great central building is the Dalai Lama's residence; at the foot are convents and hostels, occupied by lamas and pilgrims

windows are framed in stripes of red and yellow. In the quarter of the Ragyabas (scavengers whose duty it is to cut up the corpses and feed them to vultures and dogs in accordance with a charitable principle of the Buddhists) the huts are constructed of the horns of yak and sheep. In these mean surroundings are such romantically-named places as the snake-dragon temple, the Chinese torture-chamber, the edict pillar, the dancing hall, the fairy spring of the Chinese princess, the Yutok bridge with its roof of turquoise, the temple of the Buddha of Boundless Life, and the printing house of the Treatises of Transcendental Wisdom.

Outside the city are the three great monasteries of De-bung, Sera, and Gaden. The monks of these establishments play an important part in the government of the country, and here are the universities of the Lamas. De-bung with 8,000 monks is probably the largest monastery in the world; the Dalai Lama visits it every year.

Even these great monasteries are dwarfed by the Potala. The Dalai Lama's palace, probably the most impressive religious building in Asia, is superbly detached from the city at its feet. The golden summit, five gilded pavilions, rises 300 ft. above the plain. The whole is 900 ft. long. Its central mass, the private palace of the priest-king, glows a dull crimson, in fine contrast with the flashing white of the wings and base. In the audience chamber of the Potala the treaty between Tibet and Great Britain was signed, Sept. 7, 1904.

Bibliography. Journey to Lhasa and Central Tibet, S. C. Das, 1902; The Unveiling of Lhasa, E. Candler, 1905; Lhasa: the Tibet Expedition, 1903-04, P. Landon, 1906; Lhasa, the Holy City, F. S. Chapman, 1938.

Lherzolite. Igneous rock of the peridotite family. A dark green to black crystalline rock, a mixture of olivine, chromediopside, and enstatite, it is named from Lherz in the Pyrenees, where it was first described. *See* Peridotite.

L'Hôpital, MICHEL DE (c. 1505-73). French statesman. Born near Aigueperse in Auvergne, he spent his youth in Padua and Rome as a student of law, and in 1537 obtained a post under the parliament of Paris. He attended the council of Trent, 1547-48, and in 1560 was appointed the chancellor of France. Closely allied with the queen-regent Catherine de' Medici,

he caused the states-general to meet in Orleans in that year and in 1562. During the religious wars in France, the moderate L'Hôpital, bitterly opposed by the Guise faction, had to retire for a time to his château near Étampes, but he continued to have much influence at court. After the war of 1567-68 he resigned his office, and, living thenceforth in retirement, died March 13, 1573. In the 16th century the spelling of the name was l'Hospital.

Li. Chinese measure of distance, averaging about one-third of a British mile. On main roads, post-houses are usually placed 10 li from one another. The measure varies in different parts of China and is not a definite length.

Liability (Fr. *lier*, from Lat. *ligare*, to bind). Technical term for the condition of being bound in law to make good one's undertakings, and to justify, and be answerable for the consequences of, one's words and actions. Civil as distinct from moral responsibility is the subject of much statute law. With respect to contracts, at common law every person is liable upon these to the full amount of his estate, as is every partner, severally and jointly, upon the contracts of his partnership. In the interests of commercial enterprise this personal liability has been limited by various statutes (*see* Limited Liability).

As a general rule a person is liable civilly only for his own acts or omissions; but to this rule there are many exceptions, the chief of which is that a person is liable for the acts or omissions of his servants and agents acting within the scope of their express or implied authority. Formerly a husband was liable for the torts of his wife, even though they were committed against his wishes, but this liability was abolished in 1935.

In criminal law a person is rarely liable for acts or omissions of others. A person who authorizes another to commit a criminal act is, however, liable for it, and in a few cases—e.g. offences against the Food & Drugs Acts—a person may be criminally liable for the unauthorized acts or omissions of his servants or agents.

In a derivative sense the word liability is used for that in respect

of which the legal responsibility has been incurred, and specifically of debts due from a firm, liabilities being thus the opposite of assets. From the implicit meaning of subordination to external authority or power and consequent subjection to penalties, the word may also be associated with man's natural exposure to such ills as accident or disease.

Lia Fail (Gaelic, stone of destiny). Historic stone, also known as the stone of Scone, or Coronation Stone (*q.v.*), which lies under the coronation chair in Westminster Abbey. *Pron.* Leea Fyle.

Liaison (Fr. from Lat. *ligare*, to bind). Connexion or relation; frequently an illicit love affair. More commonly the term describes the relations between two or more allied armies or between the various fighting services of one country. Liaison officers are detailed to be the means of communication and intelligence between units and departments, and it is their duty to keep the units acquainted with one another's requirements, and to report to both any facts which are observed as tending to increase or decrease the efficiency of the whole.

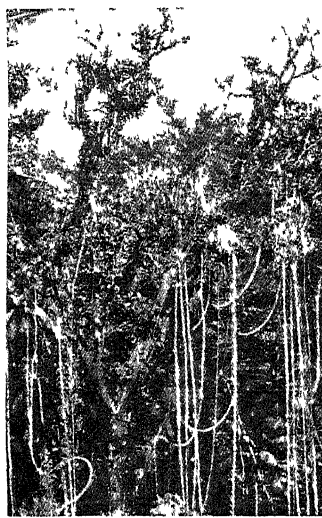
During the Second Great War liaison officers acted between the British and other Allied armies, to smooth the difficulties arising from varying regulations, while such officers working between the Royal Navy, army, and R.A.F. ensured coordination in common operations. Many govt. departments have liaison officers to act as a link between civil service officials and industrial concerns, while large business organizations also use them to ensure smooth correlation and cooperation between their various departments and activities. *See* Intelligence.

Liakhov or **LIAKHOVSKI**. Group of desolate islands off the N. coast of Siberia. They lie between the mainland and New Siberia Islands (*q.v.*) in lat. 73°-74° N. The principal ones are Great Liakhov and Little Liakhov.

Liana (perhaps from Fr. *lier*, to bind). A general term for the climbing plants of great length that occur in tropical forests. Sometimes known as monkey-ropes they spread all over forests and grow in festoons from tree to tree. They mount to the tops of the highest trees, often killing them by their deadly embrace or by shutting out the light. Some species of liana yield one kind of the rubber of commerce. Many of them may be used as ropes.



Michel de L'Hôpital,
French statesman
After Janet



Liana. Trees in a Brazilian forest showing lianas hanging from the highest branches

A liana (*Smilax*) yields the valuable medicine sarsaparilla. Some species hang the forests with flowers of tropical splendour.

Liaoning. A province of Manchuria, N.E. China. Originally one of the three provs. of Manchuria, its old area of 69,912 sq. m. was reduced to 29,200 sq. m. when Manchuria was divided into nine provs. in 1945. Lying between Hopei and Jehol on the W. and Anking on the E., this is one of the most southerly of the provs. and is divided into 25 counties, with Mukden as its capital. At the S. extremity is Port Arthur, which, originally leased by China to Russia, was transferred by the latter to Japan in 1905 for a period of 99 years; after her defeat in the Second Great War, Japan was obliged to surrender this lease to Russia. Important cities of Liaoning are Fushun, a rich coal producing centre; Penki, which has valuable iron deposits; Liaoyang and Chinkhsien. Chief products are wheat, soya bean, millet, coal, and iron. There are a network of rlys. and an excellent system of roads. The climate is the best in N.E. China, with abundant rainfall. Pop. 12,460,000.

Liaopei OR **LIAOPEH.** One of the N.E. provinces of China (Manchuria). With an area of 40,498 sq. m., it supports a pop. of 4,030,000. Szepingkai is its capital, other cities being Liaoyuan and Tungliac. Szepingkai and Liaoyuan are the principal rly. junctions. The chief products are wheat, soya bean, and millet. Liaopei extends like a belt from

N.W. to S.E. The S.E. is very fertile and suitable for mechanical farming; the N.W. has poor rainfall, but natural hill streams make the pastures good for grazing.

Liaotung. Peninsula at the S. extremity of Manchuria. The territory is also called Kwantung, and its history is given under that heading. The Gulf of Liaotung lies W. of the peninsula, with Jehol prov. on the far side. An extension of the Gulf of Chihli, it is 125 m. long N.-S. and 100 m. wide E.-W.

Liaoyang. A town in Liaoning prov., Manchuria. It is on the S. Manchuria rly., 30 m. S. by W. of Mukden, and has a pop. of 100,000. During the Russo-Japanese War of 1904 it was the scene of a battle lasting from Aug. 25 until Sept. 4. The Russians under Gen. Kuropatkin held a strong defensive position round the town, manned by 145,000 men. The Japanese attacked with 120,000 men from three directions, but although they eventually captured the town they failed to cut the Russian line of retreat to Mukden and suffered heavier casualties than their opponents. But for bad leadership and faulty intelligence and staff work the Russians would have been victorious, as Kuropatkin ordered his retreat when the Japanese were exhausted. When the Japanese invaded Manchuria in 1932, Liaoyang was occupied and remained in their hands until liberated by the Russians in 1945.

Lias. In geology, the lowest division of the Jurassic system. It consists chiefly of clays, sands, and limestones, over 1,000 ft. in thickness, and divided into the Lower, Middle, and Upper Lias. These rocks form a band across England from Devon to Yorkshire. Lias clays are important in brick-making, and where mixed with limestones they can be used for the manufacture of cement. Extensive iron ore deposits have been developed in the Lias, and these are mined in Yorks, Lincs, Leics, etc., by open-cast methods. Lias clays and limestones have abundant fossil remains, particularly those of the great reptiles, the ichthyosaurus, plesiosaurus, etc. See Fossil; Jurassic System.

Libanius (314-393). A Greek teacher and writer. A native of Antioch and brought up at Athens, he set up a school of rhetoric at Constantinople. Here, although a pagan, he numbered among his pupils John Chrysostom and Basil of Caesarea. In 354 he settled in

his native place, where he died. He enjoyed the favour of the emperor Julian, who bestowed on him the office of quaestor, and on whom he composed a funeral oration. A voluminous writer, Libanius left declamations and rhetorical exercises, panegyrics on emperors, also a life of Demosthenes and arguments of the speeches of Demosthenes. His 1,600 letters addressed to distinguished persons throw light on the times in which he lived.

Libation (Lat. *libare*, to pour a little of). In the religious ceremonies of the ancient Greeks and Romans, an offering of wine, milk, or other liquor to the gods. Such offerings, poured on the altar or on the ground, were a distinctive feature of the ceremony observed in concluding a peace.

Libau. The German name for a seaport of Latvia S.S.R., now known as Liepaja (*q.v.*).

Libel (Lat. *libellus*, little book). In law, defamation of a person by written words, print, pictures, or any publication tending to bring him into contempt or hold him up to ridicule. It also includes in law any writing of a blasphemous, treasonable, seditious, or immoral nature. Malicious intention is not necessary to make a written or printed statement libellous if it reflects on the character of another and is published without lawful justification or excuse; use of the name of a real person in a work of fiction has been held to constitute a libel.

Action lies against both the author and the publisher of a libel, who may be either sued or indicted according to the nature of the injury. The person injured can recover exemplary damages without being required to prove actual monetary loss incurred as a result of the defamation, but he must prove the loss incurred if he seeks to recover special damages for imputations upon his trade or business or earning power. It is a defence to an action for libel that the words were written or printed on a privileged occasion; thus, the written character of a servant is privileged if in accordance with truth and free from malice, as also is the written report of the financial stability of a customer given by a banker if requested to do so by the customer. In respect of both these, care must be taken to avoid publication by allowing the privileged communication to be brought to the knowledge of any person not entitled to see it.

It is a good defence in a civil action for libel that the statement

complained of is true, but in answer to an indictment the plea of justification on the ground of truth must be reinforced by a plea of justification on the ground that the publication of the statement was for the public good. The burden of proof of both rests on the defence, and no evidence of truth will be admitted if the libel is blasphemous or seditious.

The position of newspapers with regard to actions for libel was first regulated by the Libel Act of 1843, generally known as Lord Campbell's Act. This provided that, in an action for a libel contained in any public newspaper or other periodical publication, it shall be competent to the defendant to plead that such libel was inserted in such publication without actual malice and without gross negligence, and that before the commencement of the action, or at the earliest opportunity afterwards, he inserted in the offending publication a full apology for the libel; and it further permitted the defendant to make a payment into court to represent his estimate of the damage suffered by the plaintiff. The Act also extended to newspapers the right, hitherto withheld from them, of pleading the truth of the libel and justification of its publication for the public benefit.

A Newspaper's Rights

Newspapers are now entitled to publish (1) a fair and accurate report of a public meeting or (except where neither the public nor any newspaper reporter is admitted) of any meeting of a vestry, town council, board or local authority constituted under any act of parliament, or of any meeting of any commissioners, parliamentary or royal or otherwise; and (2) notices and reports issued by government offices and police authorities unless it shall be proved that such publication of either (1) or (2) was malicious.

Such protection is lost if the newspaper refuses to publish from persons injured by such reports reasonable letters explaining or contradicting the statements made.

Reports of law cases form a category apart. Fair and accurate reports of words spoken in the course of the trial in open court are absolutely privileged, but a biased or distorted summary of evidence may become the subject of an action. Thus, to publish the opening statements of plaintiff's counsel and to omit the defendant's explanations, though these were made in the course of the same hearing, is libellous.

A statement may be libellous even though no name be mentioned. For a statement made is either meant to refer to an actual person or it is not. Identification depends on more than names, and it is open to a person who believes himself to be defamed to state the construction which he himself puts on the words and which he will endeavour to induce the jury to adopt (*see Innuendo*).

In ecclesiastical and in Scots law, the word libel is applied, with greater etymological exactitude, to the articles in the writ or statement of claim in which the plaintiff sets forth his allegation. *See Slander*; consult also *Libel and Slander*, W. B. Odgers, 4th ed. 1905.

Libellatici. A name given to Christians who evaded trouble under the Decian persecution (A.D. 249-252) by means of documents known as libelli. These were of two kinds. The suspected Christian might make a declaration denying the charge, renouncing Christianity, or declaring that he had recently offered incense to an idol or was willing to do so. This was presented to the magistrate and duly recorded and published. The other form of libellus was a certificate of exemption signed by a magistrate who declared himself satisfied that the charge of Christianity was unfounded. This could usually be secured by adequate payment; and its acceptance was regarded by the Church as a less serious offence than the other form of libellus. It was punished by six months' exclusion from Communion.

Libër. In mythology, the Italian god of wine and of the fruitfulness of the earth. The Romans identified him with the Greek Bacchus or Dionysus. *See Bacchus*.

Liberal. Name taken by one of the political parties of Great Britain. The Liberal party shares with the Conservative party the history of England from 1832 to 1923, and, like its rival, took shape about the period of the first Reform Act, gradually replacing the older Whig party. Most of the Whigs were members or adherents of great families who had brought about the accession of William and Mary in 1688-89 and the Protestant succession in the person of George I in 1714. Their dominating motive was therefore to maintain the constitutional settlement achieved by two revolutions; this necessarily involved drastic limitation of the royal authority. From 1770 some sections of the Whig oligarchy were inclined to favour limited projects of political

and social reform, but on the outbreak of the French Revolution the majority followed Burke and set its face against further concession to popular sentiment. A small remnant under Fox and Grey energetically advocated wide measures of change as a method of averting the internal disruption to which France fell victim. Out of the doctrines of this group present-day Liberalism was born.

Liberalism gained in philosophic strength by acceptance of the utilitarianism of Bentham and the Mills. In the political field, it advocated the greatest possible freedom for individual development, consistent with the security and the welfare of the state. It was thus the supporter of an extended franchise, popular education, initiative in industry and commerce, and abolition of political privilege. It was widely supported in the industrial north of England, since it appealed to manufacturer and skilled workman alike. The triumph of Liberal principles was apparent in the emancipation of the Roman Catholics (1829), the Reform Act of 1832, and the repeal of the Corn Laws (1846), even though the first and third of these changes were secured from Conservative governments led by Peel.

Gladstone as Liberal Leader

On the death in 1865 of Palmerston, the Liberal leadership devolved upon Gladstone, originally an adherent of Peel. Gladstone aimed at removing every possible restraint upon freedom of trade. In foreign affairs he pursued a policy of peace, even, upon occasion, at the cost of British interests. But in 1886 the party suffered the first of many secessions on the issue of Irish home rule; the Liberal Unionists were unable to accept Gladstone's proposals. The result was a period of Conservative predominance, ended in 1906 by the greatest majority at an election which the Liberals ever gained.

Up to the First Great War the Liberals introduced instalments of their comprehensive reform programme: social insurance, the curtailment of the powers of the house of lords, Irish home rule, disestablishment of the Welsh Church. They correctly assessed the extent of Germany's Continental ambitions, and quickly came to the assistance of Belgium and France in 1914. Asquith proved less successful as a war leader than in peace, and his coalition govt. was consequently superseded

in 1916 by that of Lloyd George. This led to a fresh split which, coupled with the rise of the Labour party, robbed the Liberals of their leading position, and permitted the Conservatives to dominate almost uninterrupted the inter-war period. New divisions within the party brought a steady diminution in the party's political importance, until at the general election of 1945 it won only ten seats. In 1950 it put up 475 candidates, polled 2,621,489 votes, and secured nine seats.

Liberal Albus (Lat., white book). Volume giving the ancient laws, customs, privileges, and usages of the City of London. It was written by John Carpenter, founder of the City of London School, in 1420, three years after his election as town clerk. A transcript or duplicate copy was made in 1592; it was printed in the original Latin for the Rolls series in 1859, and in 1861 was translated by H. T. Riley.

Liberalism. Name given to the movement for greater political liberty that was a feature of European history in the 19th century. It has also a wider and more general application; for wherever there is authority, civil or religious, in human affairs, there will be, consciously or unconsciously, a tendency towards making that authority less rigid. There is also liberalism in art, literature, theology, and economics, this being a movement against accepted creeds, theories, or conventions.

In the modern and narrower sense liberalism may be said to date from the Renaissance and the Reformation, and its main activities to have been confined to Europe. The tendency towards more liberal ideas prevailed also in America, but there was not in that part of the world the same need to break through medieval traditions that there was in Europe. Asia and Africa in general stood outside, although in Asia, which in a sense includes Egypt, towards the end of the 19th century there were movements like those that earlier changed the face of Europe.

Liberalism worked in several directions. The end of the Middle Ages saw the end of serfdom over a good part of Europe, but something had still to be done before individual liberty was assured. Indeed, it was the 19th century before this particular effort of liberalism was successful in Russia. Between the Reformation and the French Revolution the central feature of liberalism was its revolt against ecclesiastical authority,

primarily, but not entirely, that of the church of Rome, for other churches were almost as intolerant. This resolved itself into a long and hard fight to remove the disabilities of nonconformity in relation to the established religions. The conflict grew in intensity with the emergence of a new social class whose influence was derived from commerce. Towns took the lead in attacking prerogative, breaking down monopoly, and reforming administration. In different countries the struggle took different courses, but its essentials were the same, and by the time of the French Revolution its ends had virtually been attained. Part of this struggle was the fight for the freedom of speech and of the press.

The Great Age of Liberalism

In the 19th century, individual liberty, economic, civil, and religious, having been assured, liberalism concentrated itself on two allied problems. One was to give the common people, as distinct from propertied classes, a share in the government of their country, a challenge to the feudal idea that the country was the personal property of the sovereign. The second was to free communities conscious of nationhood from the rule of an alien, on the principle that they had the right to choose their own ruler and form of government.

After 1815 liberal ideas made great progress. The end of the long war made it possible to put into practice ideas that had been simmering in the minds of men since they had been preached by Rousseau and other thinkers of the new age. 19th century liberalism may be described as a combination of French theory and English practice. In England the Reform Act of 1832 was the first step towards a more popular franchise, and during the century almost every other European country made similar reforms. Together with this went the demand for government responsible to the representatives of the people, an idea copied from England. Most of the German rulers were forced to grant constitutions on these lines, and for these ideas the people took up arms in 1848.

The heyday of liberalism was the later 19th century. It was characterised by the spread of religious toleration, popular education, freedom of trade, and social welfare. Parliamentary institutions based on the British model developed rapidly in every continent, and the doctrine of trustee-

ship in relation to colonial empires began to modify the claims of imperialism. Great Britain stood as the prime source of liberal ideas and no people or nation appealed to her in vain for help in shaking off oppression.

The 20th century witnessed a steep decline in the prestige of liberalism as a political doctrine and method. There has been a vast extension of the power of the state at the expense of that of the individual. *Laissez-faire* is steadily giving way to centrally planned economics. The place of liberalism tends everywhere to be taken by collectivism, a form of socialism. Extreme reactions against liberalism took place between the two Great Wars; fascism, Nazism, and the Soviet system of totalitarian creeds in which the purposes of the community or of a class take precedence over those of the individual. Traditional liberal claims to freedom of conscience, of speech, of assembly, of enterprise, and the rights of property have been subordinated to the claims of the state. But the charter of the United Nations set forth as one of its main objects the restoration of liberal economic policies.

Bibliography. Introduction to Principles of Morals and Legislation, J. Bentham, 1876; Principles of Political Obligation, T. H. Green, 1895; Liberalism, L. T. Hobhouse, 1911; Liberty in the Modern State, H. Laski, 1930; Liberty and Civilization, G. Murray, 1938; The Good Society, W. Lippmann, 1939; The Free State, D. W. Brogan, 1945.

Liberal Unionist. Name taken by those members of the Liberal party who broke away from the main body when Gladstone declared in favour of home rule for Ireland in 1886. Under the leadership of the marquess of Hartington, afterwards duke of Devonshire, and Joseph Chamberlain, an influential band of Liberals refused to agree to this, declaring for the maintenance of the union between Great Britain and Ireland.

The new party set up its own organization and remained independent, although giving general support between 1886 and 1892 to the Conservative ministry. In 1886, 81 of them were returned to the house of commons, and in 1892, 47. In 1895, when 71 were returned, their leaders joined the Conservatives in forming a ministry, and gradually the alliance between the two wings of the Unionist party, as it was now called, became closer, the final step being taken in 1912, when the party organi-

zations were amalgamated. The Liberal Unionists were from the start especially strong in Birmingham and the neighbourhood. See Chamberlain, J.; Devonshire, 8th Duke of; Home Rule; Unionist.

Liberation, ORDER OF THE. Decoration instituted by Gen. de Gaulle in 1941 to reward distinguished services rendered to the cause of the liberation of France. It was the Fighting French equivalent of the legion of honour, which, during the occupation of France, had become a Vichy decoration. The order was bestowed upon civilians as well as upon soldiers, sailors, and airmen, holders being designated companions. The badge consists of an oblong plaque down the centre of which passes a sword, the hilt bearing a square ring for the ribbon from which it is suspended. Superimposed on the blade of the sword is the cross of Lorraine, while the reverse of the plaque carries the inscription in Roman letters: "Patriam servando victoriam tulit." The ribbon is green with black stripes, symbolising France's hope and mourning.

Liberation Society. Familiar name of a society founded at a disestablishment conference in London in 1844. Promoted by Edward Miall (*q.v.*) and other nonconformists, it was first known as the British Anti-State Church Association, a title altered in 1853 to The Society for the Liberation of Religion from State Patronage and Control. It has promoted the abolition of church rates and university tests, and the removal of other disabilities affecting nonconformists, as well as the disestablishment of the Irish Church. The offices are at 32, Victoria Street, London, S.W.1, and there is issued a periodical, *The Liberator*, founded in 1854.

Liberator. Literally, one who liberates. The word has been applied especially to Daniel O'Connell, the protagonist of Roman Catholic emancipation, and to Simon Bolivar, the S. American patriot. The *Liberator* was the title of a paper issued in the U.S.A. to protest against slavery. Founded by W. L. Garrison, it lasted 1831-65. See Garrison, W. L.

Liberator. A name connected with a financial crash. The Liberator Permanent Building and Investment Society was founded 1868, and in 1882 the London and General Bank was established by Jabez Balfour, M.P., and the two enterprises, combined with the Land Allotment Company, formed

what was known as the "Balfour group." With an alleged capital of £7,000,000, they appealed to a vast Nonconformist middle class with small savings, and were responsible for many fine London buildings, including the Hotel Cecil and Whitehall Court. The companies were based on faulty finance, and a crash was postponed by false balance sheets and hazardous speculation. In 1892 the companies failed, with a total liability of over £8,000,000. Balfour, after evading justice for over two years in Argentina, was tried in 1895, and sentenced for fraud to fourteen years' penal servitude. He was released in 1906, and died in 1916.

Liberator. United States heavy bomber of the Second Great War. Designed by the Consolidated Vultee corp. of San Diego, and delivered in large numbers to the U.S. army as the B (or Boeing)-24, it was one of the first and most successful four-engined bombers. It combined a long span (110 ft.) high aspect ratio wing with a large twin tail unit and a short, deep fuselage, the last-named housing normally a crew of 7 to 9 and a three-ton bomb load. The *Liberator* was employed as a bomber in every American theatre of operations, a modified version in patrol work with R.A.F. coastal command and on the Atlantic Ferry (*q.v.*). See *Aeroplane illus.* p. 131.

Liberec. The Czech name for Reichenberg (*q.v.*) in Bohemia.

Liberia. A negro republic of Africa. It occupies the last 350 m. of the S.E. trend of the W. African coast before it turns to the E. at Cape Palmas, skirting the Gulf of Guinea. The river Mano separates it on the W. from British Sierra Leone, and the river Kavalli



Liberia arms

on the E. from the French Ivory Coast. The republic extends inland 200 m. at its widest part, and includes about 43,000 sq. m.



Liberia. Map of the Negro republic of West Africa

Early in the 19th century, a movement began in the U.S.A. for the re-settlement of freed slaves on their native continent. It was favoured by advanced negroes, and by sympathetic whites, and the homeward movement began in 1822. By 1847, the American negro population had become sufficiently numerous to form a republic, and by 1860 there were 15,000 Christian negroes with American associations in the country. By 1947 Americo-Liberians numbered about 20,000, and some 60,000 other negroes of the coast were civilized. Inland there are Mahomedan and pagan tribes, variously estimated as numbering from 1,500,000 to 2,000,000, and the country is still undeveloped.

The civilized region is the coastal strip about 20 m. wide, where there are about a dozen townships in four counties. The capital and chief port, Monrovia, at the mouth of the St. Paul river, has an est. pop. of over 10,000. The government copies the U.S. system, with a senate, house of representatives, president, vice-president, and cabinet. William Tubman became president in 1944. The electors and ministers must all be property owners, and of negro blood. Though Liberia has produced several public men of ability, the financial management of the republic has been scarcely successful, and has been saved from collapse by assistance from the U.S.A.

Though hot, the country is less unhealthy than many parts of W. Africa. It has an abundant rainfall; many rivers navigable in

stretches, though impeded by bars and broken by falls; and a productive soil, luxuriant vegetation, and dense and valuable forests. The interior rises into mountains of from 2,000 to 6,000 ft. in height. But so little has it been explored that the principal rivers have not all been traced from their entry into the country from French terri-

F. C. Lewis, but afterwards a combination of mezzotint and etching was employed, the outline being etched by Turner himself. Charles Turner, S. W. Reynolds, and Thomas Lupton were the principal engravers.

Libertad. Maritime department of N.W. Peru. It is bounded on the N. by the dept. of Lambayeque, and S. by Ancash.

The surface is mountainous, being traversed from N.W. to S.E. by the Western Cordilleras. The E. part, watered by the Marañon river, produces rice, cotton, sugar, coffee, cocoa, sarsaparilla, fruit, etc. Minerals, including gold and silver, abound, while extensive forests yield valuable timber. The al-

Liberty. Term in English law for a franchise (Fr., freedom), a royal privilege, or branch thereof, granted to a subject. One such franchise was liberty to hold a legal court, and the word liberty is applied to a district so privileged as being exempt from the jurisdiction of the sheriff, and having separate commissions of the peace. Every liberty and franchise of a county forms part of that county for purposes of local government and for parliamentary elections.

Liberty. The name given to a political party in the U.S.A. Founded in 1839, it was intended by its leaders to oppose slavery by political means, a course not favoured by those who followed W. L. Garrison. In 1840 and 1844 they ran candidates for the presidency. In 1847 they held their last national convention, amalgamating then with the Free Soil party. See Slavery; United States.

Liberty. Statue of an allegorical figure of liberty on Bedloe's Island (also called Liberty Island), New York Harbour. The work of F. Bartholdi, it was presented to the U.S.A. by the French nation to commemorate the centenary of American independence. Erected in 1885, it represents a female figure holding a torch, and is probably the largest statue in the world, being 111 ft. in height, with the torch, lit by electric light, 40 ft. higher. There is a staircase inside the figure. See New York.

Liberty, Sir ARTHUR LASENBY (1843-1917). A British merchant. He was born at Chesham, Aug. 13, 1843, and was educated at Nottingham, where his father was a lace manufacturer. He began his business career there, but moved to London, and became manager of a firm in Regent Street. In 1875 he started business on his own account, and began to put into practice the artistic ideas for dress and furnishing fabrics which he had acquired. A large business, unique in its way, was built up, and in 1894 was turned into a limited liability company. Liberty, who was knighted in 1913, rendered many services to the applied arts. He died at his residence at Great Missenden, May 11, 1917.

Liberty Bell. Bell in Independence Hall, Philadelphia, U.S.A., inscribed with the words from Lev. 25, v. 10: Proclaim liberty throughout all the land, unto all the inhabitants thereof. According to a popular legend it was rung to celebrate the Declaration of Independence on July 4, 1776. The bell used on that occasion, however,



Liberia, West Africa. Group of natives from the interior on their praying mats

tory to their exit into the Atlantic. The exports include gold, rubber, palm oil, palm kernels, piassava fibre, coffee, cocoa, ginger, chillies, ivory, annatto dye, and camwood. Besides Monrovia, the seaports are Robertsport, Marshall, Grand Bassa, and Buchanan.

The language in general use in the coastal district is English. The inland tribes do not acknowledge willingly the rule of the republic. Liberia joined the Allies in the First Great War, severing relations with Germany on May 8, 1917, and declaring war on Aug. 7. This step constituted an important landmark, as the people had long desired to free themselves from German influence, especially in commerce. The republic was one of the signatories of the treaty of Versailles, and an original member of the League of Nations. On March 31, 1942, Liberia signed an agreement allowing the U.S.A. to build airports for the duration of the Second Great War. Liberia declared war, Jan. 27, 1944, on Germany and Japan; and joined the United Nations.

Bibliography. Liberia, Sir H. Johnston, 2 vols., 1906; The Black Republic, H. F. Reeve, 1923; Economic History of Liberia, G. W. Brown, 1941.

Liber Studiorum (Lat., book of studies). A collection of 100 engravings after drawings in sepia and bistre by J. M. W. Turner (*q.v.*), executed to rival Claude Gellée's *Liber Veritatis* (*q.v.*). The first plate was an aquatint by

paca and llama have been reared here since before the Spanish conquest. The capital is Trujillo. Area, 10,206 sq. m. Pop. 383,252.

Libertia. Small genus of perennial herbs of the family Iridaceae. They are natives of Chile and Australasia, and have long, narrow grass-like leaves, and white or blue flowers.

Liberty (Lat. *libertas*, freedom). Quality or condition of freedom from restraint or constraint. Natural liberty is the unrestricted power of a person to think, say, or do whatever he pleases, subject only to the laws of nature. Religious liberty is perfect freedom to hold and profess any creed or opinion on matters of doctrine and dogma, and to worship one's own God according to one's own conscience without interference from any other person or persons. Moral liberty is freedom of choice in matters of conduct, or liberty of will as opposed to what is called philosophical necessity. Political liberty is the freedom of an autonomous nation from dictation in its affairs or curtailment of its sovereign rights by any other state. Within this is contained civil liberty, freedom of action, thought, and discussion for each and every member of a social state, limited only by constitutionally made laws and established customs, which protect each from injury by another and further the interests and secure the safety of the commonwealth. See Freedom of the Press; Liberalism.

was actually a smaller one. The Liberty Bell was cast by Lister of Whitechapel, and arrived in Philadelphia in 1752. It cracked in 1835, and in 1846 was placed on public exhibition as an historical relic. It has several times figured at American exhibitions. The bell weighs 2,080 lb. and its circumference around the lip is 12 ft.

• **Liberty, Equality, Fraternity** (Fr. *Liberté, Égalité, Fraternité*). Motto taken by the French Republic when established at the time of the Revolution in 1792. See French Revolution.

Liberty Hall. Irish labour headquarters. It is the name given to a stone building in Dublin where the Irish transport workers' union has its headquarters. It is situated at the corner of Eden quay, opposite the Liffey, and was prominent during the transport strike in 1913 led by James Larkin. During the rebellion of April, 1916, it was the headquarters of James Connolly's citizen army. It again came into prominence during the Sinn Féin disturbances, and was raided by the military, Nov. 24, 1920.

Liberty Man. Term used in the U.S. army and navy to denote a man on short leave from his unit or ship. It is sometimes applied in the British navy to ratings on after-duty shore leave, as distinct from men on 24-hour or longer leave. The vessel bringing such men ashore is called a liberty boat.

Liberty Ship. Type of American-built cargo ship designed to make good the heavy losses of Allied tonnage due to the German submarine campaign of the Second Great War. The Liberty ship building programme was put into operation in 1941 by the U.S. maritime commission, and the first vessel was delivered on Dec. 28. Vessels were of a standard design displacing 10,500 tons and having a speed of 11 knots. In their construction the mass production and prefabrication methods of the motor industry were adapted to shipbuilding. Welding replaced riveting, while the reciprocating steam engines with which the ships were powered were built by plants miles inland.

According to the original programme, a Liberty ship would take six months to build, but Henry Kaiser's Richmond, Calif., yard launched them a month after laying the keel, and on one occasion put together a ship from prefabricated parts in four days. At the peak of construction, U.S. shipyards were turning out three Liberty ships a day, and for 1943 the

number delivered was 1,238. Towards the close of the war an improved type was put into production, with 50 p.c. greater speed.

Libenum Veto (Lat., free veto). Name given to a custom prevalent in the diet of Poland by which a single dissident could veto or forbid the continuance of public business. It was first practised in the 17th century, and in 1652 enabled a single deputy to dissolve the diet. In spite of attempts to alter it, the Polish nobles refused to give it up, and its use contributed greatly to the ruin of the state. It was not abandoned till 1791, four years before the final partition. It arose from an old ideal that the decisions of public bodies must be unanimous. See Poland: History.

Libër Veritatis (Lat., book of truth). Pen and sepia sketches by Claude Gellée (*q.v.*), made as authenticating memoranda of his pictures. These were engraved in etched line and mezzotint by Richard Earlom and published by Boydell in 1777. The originals were subsequently acquired by the duke of Devonshire.

Libido (Lat. sexual craving). Term used in psychology for the mental energy attached to the sexual instincts. The word sex is used in its widest sense to cover the whole of the loving, cooperative, and friendly impulses. As mental energy cannot be weighed or measured, its existence is regarded as a convenient working hypothesis which agrees with available facts. The libido, originally narcissistic, or concentrated on the self, should normally attach itself to a series of objects; the first the child's mother, the next as a rule its father. If this process is thwarted or made painful by such factors as unkindness or frequent absences, the libido will be withdrawn from the unsuccessful attachment and regress to its original narcissism. This state is a common cause of criminal tendencies and may produce pathological states such as megalomania. *Pron.* libbi-doe.

Libitina. In classical mythology, an Italian goddess. Libitina is identified with the cultivation of the earth, especially in gardens, and with the dead. An undertaker was called *libitinarius*. She was sometimes identified with Venus, who was a protectress of gardens.

Libocedrus. A small genus of evergreen trees of the family Pinaceae (Coniferae). They are natives of America, E. Asia, and New Zealand, and from the fragrance of their wood they are known as incense cedars.

Libonias OR JACOBINIA. Genus of shrubs and herbs of the family Acanthaceae, natives of tropical America. They have opposite, somewhat leathery, undivided leaves, and large, two-lipped flowers of yellow, red or rosy hue. *Jacobinia ghesbreghtiana* is frequently grown in European hot-houses. It is a native of Mexico, and has polished, lance-shaped leaves,



Libonias. Foliage and bloom of this Central American shrub

and terminal clusters of bright scarlet flowers, which make their appearance in winter.

Libourne. Town and river port of France. It stands at the junction of the Isle and the Dordogne 17 m. E. by N. of Bordeaux, in the department of Gironde. The town hall dates from the 16th century. Industries include the making of brandy and sugar and a trade in wine. Near Libourne the Romans had a town, but the existing one dates from the 13th century. It was thus, as part of Guienne, on English territory, was a free town founded by the English, and its name was given to it by an Englishman, Roger de Leybourne. Across the Isle is Fronsac, where in the Middle Ages was a castle. Pop. 20,166.

Libra (Lat., balance, pound; Ital. *libbra*). Roman unit of weight. It was nearly equal to 12 oz. avoirdupois, and was divided into 12 *unciae* (ounces). Libra was also used as a unit of value, the old libral, or pound *as*, consisting nominally of 12 oz. of copper. The name is still used in Spain, Portugal, Mexico, and S. American countries for the pound weight, and in Peru used to be that of a gold coin, nominally worth £1. The old French *livre* and Italian *lira* (the equivalent of the franc) are derivatives, while the initial letter appears in the English £, the abbreviation for pound sterling.

Libra. One of the constellations and the seventh sign of the Zodiac. Its name was given by the Romans and means the balance. At the first point of Libra, or the autumnal equinox, the sun crosses the equator from N. to S. and day and night are equal all over the world. See Zodiac.

LIBRARIES: THEIR HISTORY AND USE

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The story of the library is here outlined from its beginning thousands of years B.C. A description of the methods by which the public library service in Great Britain is carried out follows, together with some account of the library service available in other countries

From very early times libraries (Lat. *liber*, book) have existed as storehouses for the recorded experiences of mankind. Sargon I of Akkad is believed to have founded a library of books on baked tablets of clay as early as 3800 B.C., and libraries were established in nearly all the temples and palaces of the ancient world (e.g. Nippur, c. 2500 B.C., Ashurbanipal, c. 600 B.C.; in Egypt, where papyrus was used, and Pergamus, where parchment was introduced).

Knowledge of the libraries of early Greece is confined to allusions in classical authors. Peisistratus (605–527 B.C.) was among the first to supply books to the Athenians. The first great libraries of ancient Rome were part of the spoils of war. Thus the library of the king of Macedonia was removed to Rome c. 168 B.C. Julius Caesar had a plan, unfulfilled, to form libraries throughout Rome. Two public libraries, the Octavian and the Palatine, were founded by the Emperor Augustus. There were 28 public libraries in Rome in the 4th cent.

Medieval Collections of Books

Modern libraries have their beginnings in the monastic libraries founded with the spread of Christianity through Europe and Asia Minor. Libraries in Britain began in the 6th cent. with the collections in monastic institutions. Many cathedrals also had libraries. Ireland had great schools of monastic teaching at an early date. At the suppression of the monasteries in the 16th cent., these early libraries were dispersed and much of their contents destroyed. Some of the cathedral libraries escaped, but many of their most valued treasures were pilfered.

In the 14th and 15th centuries, libraries were formed in the colleges of Oxford and Cambridge. The university library of Oxford was founded in the 14th cent. and that of Cambridge in the 15th, but the former was virtually destroyed in 1550 by the commissioners of Edward VI. It was refounded by Sir Thomas Bodley in 1602, becoming, as the Bodleian library, the first great library in Great Britain; it is still second in importance only to the British Museum library, opened in 1759. This, the greatest library in the world, owes its origin

to Sir Hans Sloane, a wealthy physician, who instructed his trustees to offer his collection to the nation for £20,000, much less than the market value. The government raised £100,000 by a lottery, and purchased in addition the Harleian MSS., and provided premises at Montagu house in Great Russell Street. The king's library was later acquired. The British Museum library was transferred to the first portion of its present premises in 1828. The famous reading room, the dome of which is the second largest in the world, was opened in 1857. The British Museum now possesses over four million printed books and nearly 150,000 MSS.

Famous British Libraries

A copy of every book published in the U.K. must be sent by the publisher to the British Museum. Under the Copyright Acts publishers must, if required, also send copies of books to the Bodleian, Oxford, to the Cambridge university library (both possess over one million vols.), to Trinity College, Dublin, to the national library of Scotland, Edinburgh (formerly the library of the faculty of advocates), and to the national library of Wales (1909). The oldest university libraries, apart from those of Oxford and Cambridge, are those of the Scottish universities of St. Andrews, Aberdeen, and Glasgow (all 15th century) and Edinburgh (1580). London has three great university libraries—those of London university, University College, and King's College, with several associated libraries (e.g. the British library of political and economic science). All the provincial universities have important libraries, notably Manchester, Birmingham, Leeds, Liverpool, and Queen's university, Belfast.

Until the 18th cent., with few exceptions the only libraries were those of religious and learned institutions and of princes, nobles, and wealthy collectors (e.g. Edward IV, Selden, Richard and Thomas Rawlinson, Heber, Grenville, the Cottons, the Harleys). With the development of science and technology, the growth of democracy, and the spread of education two vitally important types began to appear—the special library devoted to some specific dept. of knowledge—science, tech-

nology, sociology, etc.—and the general or, as it became later, the public library for the benefit and enjoyment of the ordinary man.

There were isolated examples of public libraries in the 17th cent. (in Coventry, Norwich, Leicester, Ipswich, etc., and the Chetham library at Manchester, est. in 1653 and the only ancient one still operating). The real forerunners were the public subscription libraries which date from the late 18th cent. (e.g. the Liverpool lyceum, the Leeds library, the Bradford library, etc.), and of which the outstanding example is the London library (1841), and the mechanics' institutes. The first mechanics' institute was set up in 1800 in Glasgow; until superseded by rate supported public libraries these institutes played a great part in bringing education and books to the working classes.

The public libraries of today were made possible by the Public Libraries Act of 1850 (the result of the efforts of Edward Edwards, William Ewart, and Joseph Brotherton) which authorised local councils to expend rates on free library services. Thus began one of the most influential and widely beneficial of all public services. First to provide libraries were Warrington, Brighton, Norwich, Winchester, Bolton, Ipswich, Manchester, and Oxford; the first in London was Westminster. Progress, slow at first, was accelerated by the benefactions of Passmore Edwards and Andrew Carnegie, who provided buildings. In 1913 the latter founded the Carnegie U.K. trust which continued his work by encouraging county library development, professional education for librarians, and co-operation between libraries.

Public Library Activities

Until 1919 local authorities could spend on libraries only the produce of a 1d. rate; this limitation was then removed and, by the same Act of parliament, co. councils were empowered to provide services. Since then there has been remarkable progress. Today public libraries are provided for 99.7 p.c. of the people by over 600 local bor. and co. authorities. Service is given from over 20,000 libraries and centres and over 11 million people (24 p.c. of the pop.) regularly borrow books for home reading (many more use reference and periodicals rooms). In 1947 nearly 285 million books were borrowed (an average of 6.59 books per head of pop.), 40 million books were available, and 9,343 full-time

librarians and assistants were employed (in addition to numerous part-time staff and to manual workers). The total expenditure for the year was £5,650,000—an average of 2s. 5d. per head of pop.; average expenditure by mun. libraries was over 2s. 10½d. per head; by co. libraries, over 1s. 6½d.

Public libraries are financed and managed entirely by local councils, with no assistance from or inspection or control by the central government. Support varies considerably from place to place: 51 authorities spend over 4s. per head of their pop., 34 between 3s. 6d. and 4s.; others expend much less than the average.

Public libraries are provided for the free use of all sections of the community and seek to cover the widest possible field, excluding only highly specialised material available in special and learned libraries, and the inferior and ephemeral (though all provide a good range of lighter recreational books).

The typical municipal public library has the following depts.: The lending (or circulation or home reading) dept.; the reference dept., which is a workshop where books may be consulted and studied and an

information bureau where, with the help of specially qualified staff, questions of fact, simple and complex, on all subjects are answered; the periodicals room, with a wide selection of current magazines, reviews, trade journals, etc.; in some places a newspaper room; and the children's dept. with lending and reference facilities. Many libraries also have lecture halls, and smaller rooms, used for lectures, film displays, and exhibitions, and lent to adult educational societies.

In the smaller libraries and branches depts. may be combined. In the large city libraries there are often in addition special depts. for commerce, technology, fine arts, music, etc. Most have local collections embracing as completely as possible books, prints, maps, MSS., etc., dealing with all aspects of the town or district. Some places have large collections of illus. and photographs for schools,

students, designers, etc. A few have collections of gramophone records for loan. In the larger towns, in addition to the central library, branches are established; the ideal is that no one should have to journey more than ¾ m. to the nearest service point. Everywhere, in order to borrow books, it is necessary only to fill up a form applying for tickets and agreeing to obey the simple rules; there is no charge except that those who keep books too long have to pay small fines (the date of return of a book can always be renewed without charge by timely application). If a borrower wants any book that is out (*i.e.* in the hands of another reader), he can have it reserved.

In nearly all British libraries readers are allowed to go to the shelves and choose their own books—the open access system,



Libraries. Selecting books by the "free access" system at a Nottingham public library

generally regarded as essential. Books are classified, *i.e.* arranged so that all those on a particular subject are together and related subjects are in proximity. Usually the Dewey decimal system of classification is used.

County libraries serve the areas outside those towns within the co. with their own independent library services—suburban areas, small towns, villages, and isolated country dwellers. From the H.Q. collections are sent out, with frequent exchanges, to numerous centres in schools, village clubs, shops, etc., in the villages and hamlets and to the branches in the larger places. These are in some counties supplemented by travelling libraries—vans with from 1,500 to 3,000 vols.—that visit individual homes, village centres, etc. Individual service by post is also given.

All libraries do their utmost to meet the special requirements of

individual readers and any reader, anywhere, can procure almost any book he may want if he asks for it at his usual service point. This is made possible by a fine and efficient system of cooperation. The country is divided into regions, each embracing all the mun. and co. libraries in the area and also many special and university libraries. Each region has a regional bureau usually with a catalogue of the non-fiction books in the cooperating libraries, so that any particular item can be traced. Thus if a reader asks at, say, his local village centre for a book that is not in stock there, his request goes first to his co. H.Q. or central library. If there is no copy there, the request goes to the regional bureau, and any library in the region with a copy is asked to send it to the reader, or to his local library. If no copy is available in the region the request goes to the national central library, the cornerstone of the cooperation system (supported by grants from the cooperating libraries, from the govt., and from the Carnegie U.K. trust). The N.C.L. may send the book from its own stock, buy it, or borrow it from a library in another region or from one of the many special libraries. Libraries cooperate in other ways, too; for example, the London met. bors. accept one another's tickets; a Londoner can thus use any of the public libraries in London. Each London bor. specialises in one part of the whole field of learning, thus considerably increasing the material available.

As it is the public library's greatest and special duty to society to provide a full, free opportunity for every man to pursue his own interests and thus develop his own individual personality and abilities, libraries attach the greatest importance to maintaining absolute impartiality and independence. Nevertheless, the library seeks to be the handmaid of all kinds of social, cultural, and economic movements, and to co-operate to the full with schools and adult educationists, and with social, artistic, literary, and similar organizations, thus becoming the local cultural centre.

On the whole it is best for children to go while still at school to the children's dept. of a public library, both to ensure continuity of book-use and so that libraries and books shall not be regarded by the young people as just part of their schooling (as distinct from their education). Neverthe-

less, there is a ready and valuable cooperation between public libraries and schools (*e.g.*, visits of children to learn how to use books) and it is recognized both that every school needs its own library, and that it can and must do much to teach children that the book is a lifelong key to knowledge and to happiness. Some secondary and grammar schools possess good libraries, but few elementary schools are adequately provided. Libraries are also to be found in most technical schools. Library provision is also made—sometimes by local authorities, by or in cooperation with public libraries, sometimes by other organizations—for those in hospitals, infirmaries, and prisons, and for those in the armed forces and the merchant navy. An excellent library service is provided by the national library for the blind.

Special Libraries

The first important special libraries in England—the law libraries of Lincoln's Inn and the Inner Temple, and the library of the royal college of Physicians—date back to the early 16th century. The greatest of British learned societies (the Royal Society) was established in 1660. Today there is not an important branch of learning not represented by one or more societies with its library—*e.g.*, the society of Antiquaries, the royal institute of British Architects, the British Drama league, the Chemical society, the institute of Civil Engineers, the royal academy of Music—for there are some 800 important special libraries in London alone. Some are supported by the govt., *e.g.* those of both houses of parliament and various ministries and departments (*e.g.* the War office, the ministries of Agriculture, Education, and Health) and the important libraries of the Victoria and Albert museum, the Science museum, the Natural History museum, the Patent office, the Geological museum, etc. The Public Record office, the depository of our national archives, is estimated to contain 40 million documents.

The value of library services to industry has been increasingly appreciated in recent years; many firms have their own libraries, and several groups of firms employed in various industries have allied themselves to maintain research libraries.

Of other countries, the U.S.A. is the best provided with national, state, university, and special

libraries. The national library, the library of congress at Washington, is one of the world's greatest. Of the many university libraries, those of Harvard, Yale, and Columbia are outstanding. The New York public library, in addition to its circulation dept., maintains a reference collection second only in America to the library of congress.

In Europe there are many great national, university, and learned libraries (*e.g.* the national library, Paris, the Vatican library, Rome, etc.), but in most parts of the world public libraries comparable with those in Great Britain do not exist. The public library is essentially an Anglo-American institution. In the U.S.A. the movement also began about 1850. U.S. libraries have been on the whole well supported and have enjoyed numerous private benefactions; there are some 7,500 independent public library systems. The country districts are not so well served as in Great Britain, and over one quarter of the total pop. is still without any public library service.

Dominions Public Libraries

Public libraries in the British Commonwealth overseas are on the whole behind those of the U.K. In Canada there is provision in the towns, and in some parts—*e.g.* British Columbia—of the country. Elsewhere the subscription library has persisted. In S. Africa there are a few municipal libraries, and in 1941 the Transvaal started a scheme for the prov. which was followed by other provs. (particularly the Cape of Good Hope). In Australia, where each state has long supported its state public reference library (with some subsidiary assistance to its country dists.), such pioneer local authorities as Sydney, Prahran, and S. Melbourne have been joined by an increasing number of others in setting up genuine public libraries, notably in N.S.W. and Tasmania. In New Zealand there are several good mun. libraries and the national library service promotes efficient service throughout the small towns and country districts.

In Europe, Denmark has probably the best service. Libraries on the Anglo-American pattern also exist in Norway and Sweden. In Russia a well-developed, widespread service exists. Elsewhere the service is inferior, but progress, as yet slow, is being made in France, Germany, Czecho-Slovakia, Belgium, the Netherlands, and Poland. There are also the be-

ginnings of public library services in India and China.

The peoples of the rest of the world remain deprived of that access to information and ideas that the public library alone can provide. Unless people can read and have full, free opportunity to use books, there can be no extension of the democratic way of life. The provision of world-wide public libraries is therefore one of the first objectives of U.N.E.S.C.O.

Librarianship as a Profession

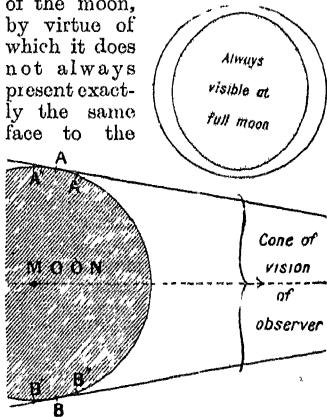
With the development of libraries the profession of librarianship came into being. The first librarians were scholars and keepers of books. Gradually it became obvious that libraries had to be organized and administered efficiently so that their contents might be made fully available and useful; that librarianship called for its own techniques, and must be based upon a sound philosophy of service.

The librarian of today has to undergo an exacting course of training. In Great Britain library workers must study for the examinations of the library association (an association of librarians, library authorities, and others interested in library development, and holding a royal charter), which maintains a register of qualified chartered librarians. Tuition is given at the London university school of librarianship and several other full-time schools and by part-time classes and correspondence courses. See Library Association.

Bibliography. The Care of Books, J. W. Clark, 1909; Old English Libraries, E. A. Savage, 1911; The Students' Guide to the Libraries of London, R. A. Rye, 1927; The University and College Libraries of G.B. and Ireland, L. Newcombe, 1927; The Uses of Libraries, R. A. Baker (ed.), 1930; Libraries and Museums, Sir F. G. Kenyon, 1930; The Chained Library, B. H. Streeter, 1931; The Public Library Movement in G.B. and Ireland, J. Minto, 1932; The World's Great Libraries, A. Esdaile and M. Burton, 2 vols., 1934-37; Library Cooperation in Europe, J. H. P. Pafford, 1935; Libraries and the Public, L. R. McColvin, 1937; Library Cooperation in the British Isles, L. Newcombe, 1937; The Medieval Library, J. W. Thompson, 1939; The Library and the Community, L. S. Jast, 1939; The Chronology of Librarianship, J. H. Thornton, 1941; The Public Library System of G.B., L. R. McColvin, 1942; British Libraries, L. R. McColvin and J. Revie, 1946; The British Museum Library, A. Esdaile, 1946.

Library Association. British organization founded in 1877 to promote the better administration of libraries, encourage bibliographical study and research, hold examinations in librarianship, and issue certificates of efficiency. In 1898 it obtained a royal charter. A professional register contains the names of 2,600 qualified fellows (F.L.A.) and associates (A.L.A.). The total membership is 7,500, not confined to any country or to the librarian's profession. The association publishes a monthly record and year book and a subject index to 600 periodicals. The offices are at Chaucer House, Malet Place, London, W.C.1.

Libration (Lat. *librare*, to balance). In astronomy, name given to certain apparent movements of the moon, by virtue of which it does not always present exactly the same face to the



Libration. Diagram showing, much exaggerated, the alternation in the moon's position within the cone of vision of an observer on the earth. Top, right, the total effect of the three lunar librations. See text

earth. The librations of the moon are three: (1) in longitude; (2) in latitude; (3) diurnal. The rate of motion of the moon round the earth varies, in consequence of which a little more than one face of the moon is seen, a strip of $7^{\circ} 45'$ alternately on the W. and E. sides. This is the libration in longitude.

Since the equatorial plane of the moon is inclined at about $6\frac{1}{2}^{\circ}$ to the plane of its orbit, the regions round the poles are alternately visible, giving rise to the term libration in latitude. Diurnal libration is due to the position of the observer on the surface of the earth to the right or left of the line joining the centres of the two bodies. The observer looks over the W. edge of the rising moon and the E. edge of the setting moon by 1° . The sum total of the three librations is that 59 p.c. of the surface of the moon is visible at one time or

another. In the diagram, where the distances, etc., are much exaggerated, the moon is shown in section in its mean position within the cone of vision of an observer on the earth; then the surface between A and B is visible; at the extreme positions A' and B' or A'' and B'' are just visible; hence the portion A' B'' is always visible at full moon and the portions A' A'' and B' B'' are sometimes seen. If the diagram be taken as a horizontal section it illustrates libration in longitude; if it is a vertical section it shows libration in latitude; if the position of the observer changes so that he sees A' B' at one extreme and A'' B'' at the other, then the libration is diurnal. The diagram also shows above in an exaggerated degree the total of all the three librations. The shaded portion, 41 p.c., is always visible at full moon; an equivalent area behind the moon has never been seen, and the unshaded 9 p.c. is half the area which is seen occasionally. See Moon.

Libre Belgique, LA (Free Belgium). Journal that appeared at intervals in Brussels during the German occupation of 1914-18. The German authorities offered a reward of 75,000 marks (£3,750) for information regarding the editors and publishers. Every time it was issued while Gen. von Bissing was governor, a copy was found in his morning correspondence. The paper announced that it was written and printed in a motor car. A paper with the same title was issued monthly from Aug. 15, 1940, until the liberation of Belgium in Sept., 1944. See illus. p. 1062.

Libretto (Ital., little book). Designation used for the text for musical treatment in opera, oratorio, or cantata, particularly opera. Originating in the 16th century, the libretto became a compromise between the claims of music and of drama. Persons unnecessary to the action had to be introduced and situations contrived solely to provide opportunities for the various solo and concerted numbers required by the composer.

Such stagecraft being *sui*

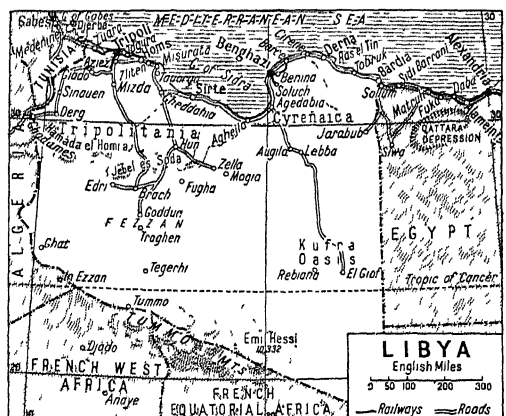
generis, produced a class of librettists who, notwithstanding a certain dexterity in complying with the composer's demands, were lacking in dramatic feeling and in literary efficiency. With the Romantic movement in music which distinguished the 19th century, it was inevitable that composers should rebel against such banalities.

Beethoven and Mendelssohn, amongst others, searched long for opera "books" which would satisfy them, but it was Wagner who effected a revolution by becoming his own librettist. Operas now most in favour are those in which the dramatic and human interests are strong, and in which there is at least a reasonable amount of literary quality.

Libreville. Capital and seaport of Gabun, French W. Africa. Situated on the estuary of the Gabun, it was established in 1849 as a settlement for freed slaves. A submarine cable is in direct communication with Europe, via Dakar or St. Vincent.

Libya. The Greek name for the continent of Africa. In the earlier period, however, the name was usually applied to Africa exclusive of Egypt, Herodotus and other writers maintaining that Egypt was properly a portion of Asia. See Africa.

Libya. A country of N. Africa, bounded on the W. by Tunisia and Algeria, S. by French Central Africa, E. by Egypt and the Sudan. Libya was annexed by Italy from Turkey in 1911, and the former's sovereignty was recognized in 1912 by the treaty of Ouchy. Italian colonisation at first made slow progress, the Senussi inhabitants being hostile; but under Mussolini great strides



Libya. Country in N. Africa, the scene of much fighting in the Second Great War.

were made. Railways and roads were built linking the chief towns, and settlers were established in colonies in the coastal plain and in the steppe district and the hills (Jebel) just inland. Barley and fruit were cultivated. The old towns were rebuilt, and new towns founded for immigrants in great numbers with state assistance. The pop. of Libya on Dec. 31, 1938, was 888,401, of whom 96,000 were European.

With an area of 679,358 sq. m., the country was divided into the four provinces of Tripoli, Misurata, Benghazi, and Derna (213,876 sq. m.; pop. about 705,000), and the Libyan Sahara; in 1939 the four provs. were incorporated into the national territory of Italy. After the Second Great War Libya was under Allied occupation. Cyrenaica (*q.v.*) was given a constitution in 1949, and all Libya was to be independent by 1952. The chief towns are Tripoli, Benghazi, Derna, and Homs, with the oasis towns of Ghadames, Murzuk, and Ghat. Dates, olives, oranges, and other tropical fruits are produced; there is fishing for sponges and tunny; tobacco, salt, carpets, and leather goods are the manufactures. See N. Africa Campaigns: see also Italy: Colonial Empire: Tripolitania; consult Fourth Shore, M. Moore, 1940.

Libyan Desert. A desert tract, lying between Egypt, the central Sudan, and Tripoli, forming the N.E. extremity of the Sahara. Although in the main a sterile, sandy tract, frequently broken by low, undulating hills, it has numerous oases, particularly those in Egypt, viz. the Great Oasis (Wah-el-Kharga), the Lesser Oasis (Wah-el-Bahariya), and the Oases of Dakhla (Wah-el-Gharbi), Farafra, the Fayum (on the E. borders of the desert), and Siwa. It was crossed by Rosita Forbes in her journey to Kufra (*q.v.*) the Senussi headquarters, in 1920.

With the entry of Italy into the Second Great War, fighting continued in the Libyan desert with varying fortunes from the first advance of the Italians to Sidi Barrani until the 8th army's final triumphant sweep across the whole width of Libya to join the 1st army in Tunisia. See Eighth Army; Long Range Desert Group; N. Africa Campaigns.

Libyans. Primitive people inhabiting the Mediterranean coastlands of Africa at the dawn of history. They are the Lehabim of Gen. and the Lubims of 2 Chron. As depicted on XIIth dynasty

tombs (Beni Hasan), they wore ostrich feathers in the hair, bore tribal tattoo marks, and the women carried their babies upon their backs. They were Neolithic hunters and pastoral tent-dwellers, lighter-hued than the dynastic Egyptians, and—before the coming of the Hamite-Semite stock—represented the earliest Mediterranean type of the wavy-haired Caucasian peoples. Their modern descendants are the Berbers (*q.v.*). See Guanches.

Licancaur. A volcanic peak of the Andes, South America. Licancaur is situated on the border of S. Bolivia and N.E. Chile, in the Desoblado region, E. of Atacama. Having an alt. of 19,500 ft., it was first ascended in 1886 by Sanfelice.

Licata. A seaport of Sicily, in the prov. of Agrigento. On the S. coast 24 m. direct and 53 m. by rly. S.E. of Agrigento, it is near the mouth of the Salso river. It occupies the site of a town, built about 283 B.C. by Phintias, tyrant of Agragas. Close to the adjacent promontory, called Eknomos by the Greeks, the Romans gained a naval victory over the Carthaginians in 256 B.C. Pop. 25,500.

Licence (Lat. *licentia*, permission to act). In law, an authorisation from competent authority to do something which otherwise would be unlawful as being prohibited by statute or constituting an infringement of some other person's private right. The word is also used of the document conveying the authorisation.

Music and dancing licences are required for houses kept for public dancing, music, and similar entertainments. Excise licences are necessary to carry on various trades, e.g. appraisers, auctioneers, dealers in plate, makers of playing cards, dealers in tobacco, pawnbrokers, and pedlars; also for keeping carriages, motor vehicles, dogs, radio receivers and transmitters, and to carry a gun or kill game. Dealers in game require a licence both from the justices and from the excise. To another category belongs the licence necessary before marriage without publication of banns. The many government controls introduced in the U.K. as a result of the Second Great War necessitated the introduction of many additional licences or permits; e.g. for building or repairs to a private house. See Excise; Liquor Control; Marriage.

Licensing Laws. In Great Britain a term applied to the laws governing the manufacture and sale of intoxicating liquors, and in

particular their sale by retail. Before any person can engage in any of these activities he must, subject to certain exceptions, obtain an excise licence from the commissioners of customs and excise. The obtaining of a licence for manufacture or wholesale sale is largely merely a matter of paying the amount of the duty; but, before an excise licence for sale by retail can be obtained, it is with a few exceptions necessary for the applicant first to obtain a justices' licence (*i.e.* a certificate from the local divisional licensing committee in a county, or borough licensing committee in a borough) authorising the excise authorities to grant the excise licence. These committees are appointed by the justices from their own body.

Sale by retail in the case of spirits, wine, or sweets (*i.e.* British wine and other fermented liquor made from fruit and sugar, or from fruit or sugar mixed with some other material) means a sale in quantities not exceeding two gallons or one dozen quart bottles; and for beer a sale in quantities not exceeding 4½ gallons or two dozen quart bottles.

"On" and "Off" Licences.

Excise licences may be either "on" or "off" licences. "On" licences authorise the sale for consumption either "on" or "off" the premises; but under an "off" licence the sale must be for consumption "off" the premises. Licences may also be classified according to the type of liquor which may be sold by the holders: (1) a spirit "on" licence, permitting the sale not only of spirits but also of beer (including ale, porter, and cider), wines, and sweets; (2) a beer "on" licence, under which beer (as above defined) can be sold; (3) a cider "on" licence, authorising the sale of cider or perry; (4) a wine "on" licence, authorising the sale of wine or sweets; (5) a sweets "on" licence, authorising only the sale of sweets. To each of the above there is a corresponding "off" licence.

With a very few limited exceptions a justices' licence is required before any of the above excise licences will be granted. Under an "off" licence, spirits, wine, or sweets must not be sold in open vessels; spirits must not be sold in quantities less than one quart (although one pint may be sold if in one container); wine must not be sold in quantities less than one pint. All the various licensees pay duties to the revenue which

are altered from time to time by finance Acts. Such duties are generally based on the annual value of the licensed property, sometimes on population.

Term of a Licence

The Licensing (Consolidation) Act, 1910, provides that licences may be granted by licensing justices at their annual meeting to such persons as they think fit and proper. As a rule, every licence must be renewed annually. It runs from April 5; but the justices may allow one for a term not exceeding 7 years. In the case of old licences, *i.e.* those granted before Aug. 15, 1904, justices have no power to refuse to renew a licence unless (1) the premises have been ill-conducted; (2) the premises are structurally deficient or unsuitable; (3) the licensee is unfit or of bad character, *e.g.* has been convicted of permitting gaming or getting drunk on the premises; (4) the renewal would be void. In the case of old beer licences, which means in general beer "on" licences in existence since 1869, the power of refusal is limited in a similar way. In such cases, however, the justices may refer the renewal to the compensation authority, which in a borough is a committee of the justices, and in a county is a committee of quarter sessions. This authority may refuse to renew, but the licensee is then entitled to compensation from a fund made up of contributions levied on the holders of old licences in each area. When a new licence is granted (since 1904) the grantee must pay monopoly value, *i.e.* a sum which is supposed to represent the value of the monopoly right granted to him.

In exercising their functions under the licensing Acts, justices are not, strictly speaking, sitting as a court. They are an administrative, and not a judicial, body. Yet they must act in a judicial manner and not without evidence. If licensing justices refuse to renew or transfer a licence, the licensee may appeal. There is no appeal from a refusal to grant a new licence; but if the justices grant one it must come for confirmation to the confirming authority, and then any opponent may be heard against it. A licence may be granted for seven days in the week, except in Wales where Sunday closing is compulsory.

Permitted hours during which intoxicating liquor may be sold by retail are: on week-days, in London nine hours beginning not

earlier than 11 a.m. and ending not later than 11 p.m., outside London, eight hours beginning not earlier than 11 a.m. and ending not later than 10 p.m.; on Sundays, Christmas Day, and Good Friday, both in and out of London, five hours, of which not more than two must be between noon and 3 p.m. and not more than three between 6 p.m. and 10 p.m. The actual hours are fixed by the licensing justices or in the case of a club by the club rules. Drinks with meals may be ordered on weekdays in restaurants and public rooms in hotels during one hour after the end of the permitted hours in the evening. In certain parts of London, hotels and restaurants which have a music and dancing licence, and registered clubs specially certified by the London County Council, may obtain a special hours certificate under which the permitted hours are from 12.30 p.m. to 2.0 a.m., with a break from 3 p.m. to 6.30 p.m. Some control was introduced in 1949 over parties organised for gain. At such parties it is illegal to supply or consume intoxicating liquor except during the normal permitted hours. All clubs where intoxicating liquors are sold to members must be registered; and if such a club is found to be disorderly, or to permit breaches of the law, it may be struck off the register by a magistrates' court.

Special provisions relating to the sale by retail of intoxicating liquor apply in theatres, certain canteens, passenger vessels and aircraft, and railway cars. There are many exemptions under various Acts of parliament relating to sales at booths or tents during fairs and races.

In the districts of Carlisle, Cromarty Firth, and Gretna there has been since 1921 a system under which the home secretary may prohibit the sale by retail or the supply in licensed premises of any intoxicating liquor, and may himself undertake the supply. This system has by the Licensing Act, 1949, been extended to new towns under the New Towns Act, 1946. Local advisory committees are set up to assist the home secretary.

The licensing laws of Scotland are in broad outline similar to the laws of England. There is, however, one important difference. The Temperance (Scotland) Act, 1913, gives power to one-tenth of the electors in any "area" as defined by the Act to demand a poll. At such polls there are to be

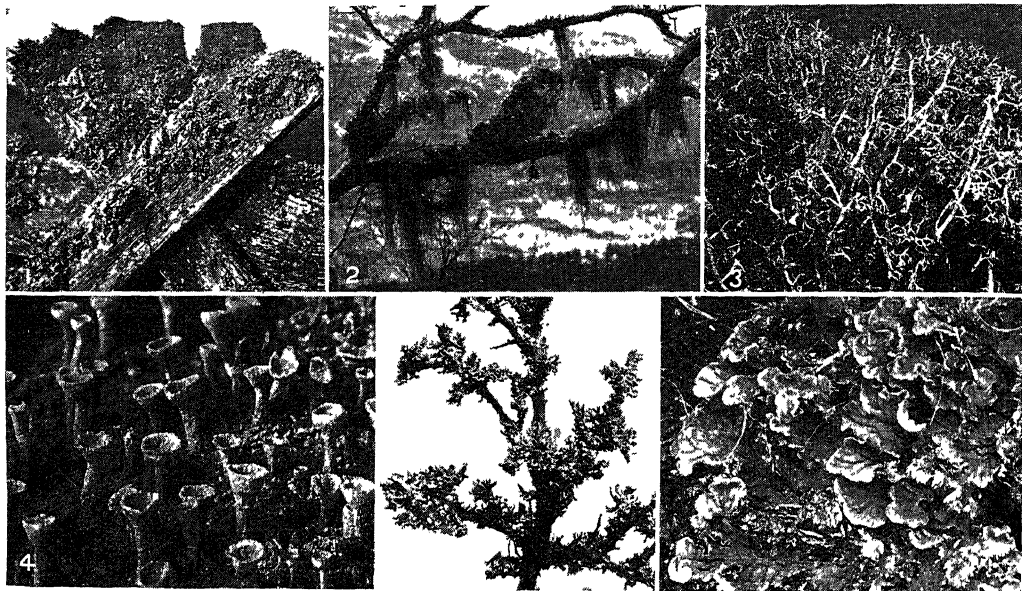
submitted to the electors three questions: (1) no licence, *i.e.* prohibition in the area; (2) reduction; (3) no change. This matter is one of local politics rather than of law; but it may be noted that if a no-licence resolution is carried, the licensing justices may grant a licence to one hotel or restaurant within the area, the holder of which may supply liquor with meals.

In the U.S.A. there are no licensing laws. In Canada the laws differ in the various provinces, one of the most interesting systems being that of Ontario, where the grant of licences is in the hands of honorary local commissioners appointed for the purpose by the lieutenant-governor of the province. British crown colonies generally have adopted licensing laws based on the English system, *i.e.* excise licences are procurable after the grant of licences by magistrates. See Prohibition.

Lichen (Gr. *leikhēn*). A dual plant, each apparent individual being a colony of algae and fungi, living symbiotically—*i.e.* each supplying some need of the other. Till 1866 this large group was considered as a distinct division of the flowerless plants; but, although it is still convenient to classify lichens under their old generic and specific names, as though they were autonomous, their proper classification is under *Ascomycetes*, a division of the fungi.

The body of the lichen, so compounded of two elements, is known as a thallus, and it may be a thin scale or disk spread out upon the surface of a tree-trunk, rock, or earth, *i.e.* crustaceous; or divided into lobes, *i.e.* foliaceous; or stem-like with branches, when it is called fruticose. If a lichen be cut through and the section microscopically examined it will be found to consist of a greyish network of filaments, the fungal element, enclosing a large number of simple green cells, the algal element. With the aid of certain filaments on the lower surface of the lichen, the fungus obtains water and mineral substances from the soil and these feed the green cells. These last assimilate carbon dioxide in the usual way and form carbohydrates. On these reserves the fungal threads draw and manufacture proteins.

By the continuous renewal of both elements the compound organism can live almost indefinitely, enduring extremes of cold and heat, on the high-tide rocks of the seashore, the summits of lofty



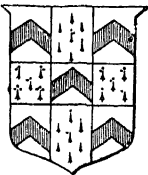
Lichen. 1. *Evernia* rooted on an old wooden fence. 2. *Usnea barbata* (Old Man's Beard) growing attached to branches of a rowan tree. 3. *Cladonia rangiferina* (Reindeer Moss) grows on the ground and greatly resembles moss. 4. *Cladonia pyxidata* (Pixie Cups) grows on the ground and on rocks and walls. 5. *Parmelia phycodes* covers whole bushes. 6. *Peltigera canina*, a leafy type, grows on damp ground and in shady places

mountains, the moist bark of forest trees or the dry brick walls of the dwelling, under the shelter of heather on a British heath, or under the snow in the polar regions. Reproduction is effected chiefly by throwing out soredia—algal cells invested with a wisp or two of fungal thread. A few lichens have been used as food or medicine, but their chief economic value is as dye-stuffs. See Beard Moss; Botany; Cudbear; Fungus; Iceland Moss; Lung of Oak; Moss; Reindeer Moss. *Pron.* liken.

Lichen (Gr. *leikhēn*). A disease of the skin. The common form, *Lichen planus*, is characterised by an eruption of small flat papules. The cause is unknown. Shock or worry and insomnia have often preceded an attack, and the disease is more common in women than in men. The sites most commonly affected are the fronts of the wrists and forearms, the fronts of the legs, and the inner sides of the thighs. Sometimes the eruption covers the whole body, but the face is rarely involved. The mucous membranes are also affected, and itching is a marked symptom. The condition comes on gradually and lasts for several weeks or months, sometimes years. Recurrence may take place, however, after recovery. Warm alkaline baths soothe the irritation, and ointments and lotions containing preparations of tar, and other drugs, may be applied to

relieve itching. Other forms of lichen are not common in England.

Lichfield. City, mun. bor., and market town of Staffordshire, England. In the S. of the co., it is 117 m. by rly. N.W. of London and 16 m. S.E. of Stafford. It is chiefly famous for its 13th cent. cathedral; of its three spires the central one was taken down as unsafe in 1949. Features of this beautiful building are the west



Lichfield arms

front, (19th cent. restoration). chapter house, and lady chapel, while inside are Chantry's Sleeping Children and some unusually fine glass. The city was the birthplace of Dr. Johnson; the house in which he was born has been made into a museum. It has associations with Garriek, Addison, and Anna Seward. The churches include S. Chad's, S. Michael's, and S. Mary's. Old buildings include the guildhall, S. John's hospital, dating from 1495, and an inn, The Three Crowns. The city has a public library and museum, an old grammar school, episcopal palace, and theological college. An agricultural centre, it has industry.

Lichfield owed its origin to the fact that S. Chad, c. 669, made it the seat of a bishopric for Mercia. From 786 to 803 this was an arch-

bishopric. From 1075 to 1148 there was no bishop of Lichfield, but when the office was restored the present cathedral was begun. A castle was built and there was a guild. The first of several charters dates from 1357, and the city was separately represented in parliament until 1885; with Tamworth it now forms a co. constituency. Its buildings were seriously damaged during the Civil War. Since 1835 it has been governed by a mayor and corporation, who supplanted the two bailiffs and 24 brethren of the old corporation. Market day, Fri. Pop. 11,000. See Chantry; Johnson, Samuel.

Lichnowsky, CHARLES MAX, PRINCE (1860–1928). A German diplomatist. Of an ancient family of Polish stock, he was born at Kreuzenort, near Ratibor, March 8, 1860. After adopting a military career, he entered the diplomatic service in 1889, and filled posts in London, Constantinople, Stockholm, and Vienna, before becoming departmental chief in the Berlin foreign office. He was German ambassador in London from 1912 until the outbreak of the First Great War. He was credited with a genuine desire to improve Anglo-German relations; his memorandum, *My Mission to London*, published without his consent in 1918, charged Germany with having destroyed the chance of peace, and in consequence he had to resign. After the collapse of

Germany he joined the democratic party. An English edition of his memoirs appeared in 1928 under the title *Heading for the Abyss*. He died Feb. 27 that year.

Lichtenberg. One-time German principality, created by the Vienna congress of 1815 as an indemnity for territorial losses of Duke Ernest I of Saxe-Coburg.

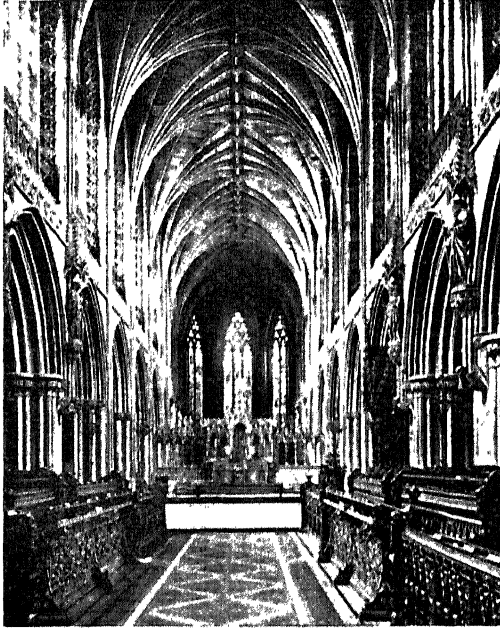
Of its numerous families the chief were those of Calvus, Crassus, Lucullus, and Murena. The best known of its earliest representatives was Gaius Licinius Calvus Stolo, tribune of the people 377 B.C. With his colleague Lucius Sextius he brought forward a number of *rogationes* (bills), the object of which was to improve the economic

condition of the plebeians by lightening the burden of debt, forbidding any citizen to occupy more than a certain amount of land, and making the employment of a certain number of free labourers compulsory. A further demand was that one of the two consuls chosen must be a plebeian.

Licinius was twice consul, 364 and 361. Accused of violating his own law as to the amount of his holdings, he was heavily fined.

Licinio, GIOVANNI ANTONIO (1483-1531). Name of the Italian painter, better known, from his birthplace, as Il Pordenone (*q.v.*).

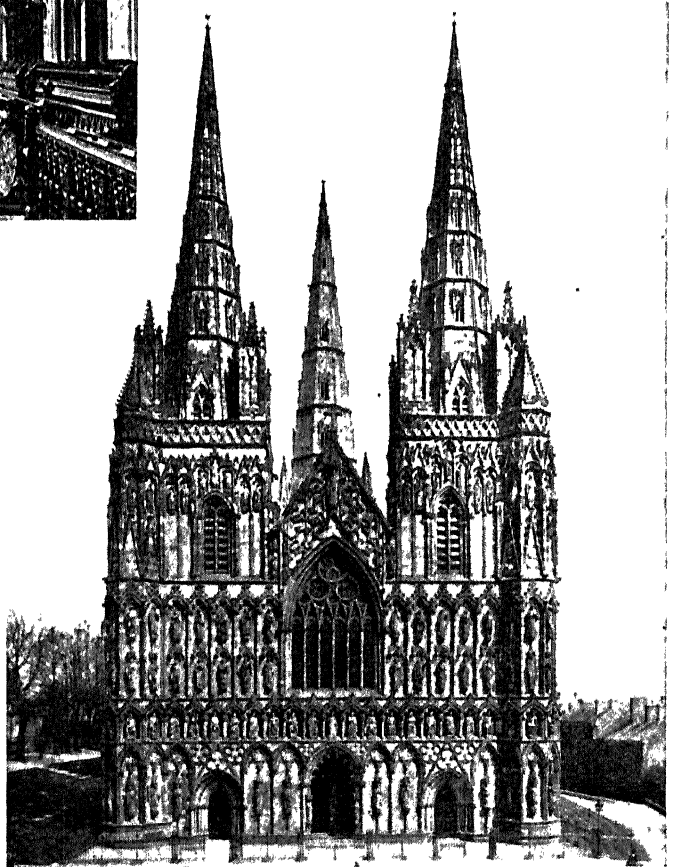
Licinius. Roman emperor 307-324. Born of Dacian peasant stock, Flavius Galerius Valerius Licinianus Licinius was promoted by the emperor Galerius, who made him ruler of Illyricum. He defeated Maximinus II in 313, and became sole ruler of the E. half of the empire. Hostilities broke out between him and Constantine, who adopted a policy of toleration towards the Christians in the W., while Licinius continued to persecute them. By the edict of Mediolanum, toleration was to be practised throughout the empire, but Licinius began persecution again in 321. The final struggle for mastery of the whole empire came in 324, when Licinius was defeated by Constantine at



In the Saar district, it was enclosed by the rivers Nahe, Blies, and Glan. In 1834 the duke sold this area of about 220 sq. m. to Prussia, which incorporated it in the Rhine province. Lichtenberg is also the name of several small German towns and a Berlin suburb.

Lichtenburg. A town of Transvaal, 140½ m. by rly. W. from Johannesburg, and terminus of a branch line from Coligny. It is in the centre of a district once used for experiments in dry-farming, but is better known for the valuable diamond fields opened in 1926 at Bakerville, N. of the town, and in 1927 at Grasfontein. There were record "rushes" of prospectors. The yield of diamonds was worth approx. £15,000,000. Other fields were opened later, but legislation has restricted output. Pop. of town 5,811 (3,240 whites).

Licinia. Name of one of the Roman *gentes* or clans. Sprung from Etruria or Tusculum, of plebeian origin, it produced many distinguished Romans, especially towards the end of the republic.



Lichfield, Staffordshire. West front of the cathedral; the central spire was removed in 1949. Top, left, interior of chancel, looking east

Hadrianople and at Chalcedon, taken prisoner, and put to death, notwithstanding a promise that his life should be spared. Constantine was left master of the empire.

Lick Observatory. A stellar observatory on Mount Hamilton, California, U.S.A. The atmosphere is so clear and free from mist that nightly observation can be made for six months or more of the year. Founded in 1876, it was given to California university at a cost of £100,000 by James Lick, a San Francisco millionaire, who also left an endowment of £20,000 for its maintenance. Lick's body is buried under the foundation pier of the 36-in. equatorial telescope. In 1895 the observatory was presented with a 36-in. silver-on-glass reflector mirror by Henry Crossley of Halifax, England. In 1947 there was being installed a 120-in. reflecting telescope which will enable observations to be made up to a distance of 900,000,000 light-years. Observations at this observatory have resulted in valuable contributions to the science of spectrography.

Lictor. Officer who walked in front of certain of the higher magistrates of ancient Rome. He bore on his left shoulder the *fascēs* (*q.v.*), a bundle of rods with



Lictor bearing the fascēs

an axe bound in the middle, which symbolised the magistrate's power of corporal and capital punishment. The number of lictors varied from one for the *Flamen Dialis* to 24 for a dictator. The name comes from *ligare*, to bind, or *licere*, to summon. See Imperium.

Liddell, HENRY GEORGE (1811-98). British scholar, born Feb. 6, 1811. Educated at Charterhouse and Christ Church, Oxford, he became a lecturer at the latter. Having been ordained, he went in 1846 to Westminster as headmaster, remaining until 1855, when he succeeded Gaisford as dean of Christ Church. He held that post until 1891, being also vice-chancellor of Oxford, 1870-74, and died Jan. 18, 1898. As dean, Liddell, aided by a graceful manner and a stately presence, was a great success and an influential figure. His daughter Alice, later Mrs.

Hargreaves (d. 1934), was Lewis Carroll's Alice in Wonderland.

He is best known as part author of Liddell and Scott's *Lexicon*, still the outstanding work of its kind. Based on the incomplete Greek-German lexicon of Pasow of Breslau, the first edition appeared in 1843, and the eighth, which included much new matter, was prepared by Liddell alone and published in 1897. A new edition by H. Stuart-Jones was put in preparation in 1911, a revision being rendered necessary by the discovery of a large body of Greek literature.

Liddell Hart, BASIL HENRY (b. 1895). A British writer on military topics. He was born Oct. 31, 1895, and educated at S. Paul's and Corpus Christi College, Cambridge. After serving throughout the First Great War, he went on half-pay in 1924, and was military correspondent of the *Daily Telegraph*, 1925-35, and of *The Times*, 1935-39. He was also military editor of the *Encyclopædia Britannica*, and Lees-Knowles lecturer at Trinity College, Cambridge, 1932-33. He worked out a form of battle drill in 1917 and wrote the official manual of infantry training in 1920. Many of his views on infantry tactics were adopted in the Second Great War. His best-known books include *The Making of Modern Armies*, 1927; *The Future of Infantry*, 1933; *Dynamic Defence*, 1940; *The Expanding War*, 1942; *The Revolution in Warfare*, 1945.

Liddesdale. District of Roxburghshire and Dumfriesshire, Scotland. It is the valley of the Liddel, a stream flowing for 26 m.

to join the Esk, and forming for 7 m. the boundary with England. Hermitage Castle, a stronghold dating from the 13th century, is in the vale; it stands on a hill overlooking Hermitage Water, which runs into the Liddel. A building of great size and strength, it is one of the most interesting of its kind in Scotland. It was the property of the

Douglasses and then of the Hepburns, by exchange for Bothwell castle. The lords of Liddesdale had a castle at Castleton, where the Hermitage falls into the Liddel. The historical buildings in the vale, include Mangerton and other towers. Dandie Dinmont, who figures in Scott's *Guy Mannering*, was a Liddesdale farmer.

Liddle, ROBERT WILLIAM (1864-1917). British organist and composer. Born at Durham, and educated at the cathedral choir school, he was a chorister of the cathedral. Appointed organist of North Berwick, he took the same post at Southwell cathedral in 1888, the youngest cathedral organist in England. His works include a service in A, and two anthems: *Send Out Thy Light*; *Save, Lord, and Hear Us*.

Liddon, HENRY PARRY (1829-90). British divine. The son of a naval officer, he was born at N. Stoneham, Hants, Aug. 20, 1829. Educated at King's College School and Christ Church, Oxford, he became a curate at Wantage. In 1854 he was made vice-principal of the theological college at Cuddesdon, and in 1859 vice-principal of S. Edmund Hall, Oxford. Among the followers of Pusey, in 1870 he was appointed canon residentiary of S. Paul's, but his connexion with Oxford was not broken, for he was Ireland professor of exegesis until 1882. He remained at S. Paul's until his death, at Weston-super-Mare, Sept. 9, 1890.

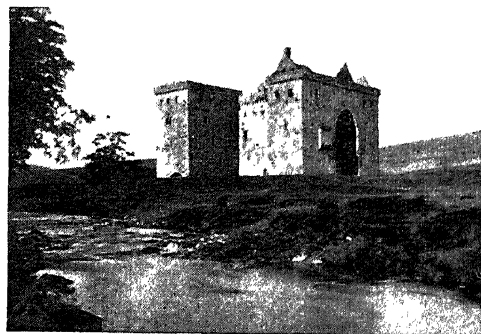
Liddon belonged to the high church school, and was a vigorous defender of orthodoxy. His theological writings include the *Bampton*



H. G. Liddell, British scholar
After G. Richmond



Henry Parry Liddon, British divine



Liddesdale, Roxburghshire. Hermitage Castle, a 13th cent. stronghold, formerly belonging to the Douglasses

Lectures on the divinity of Christ, and several volumes of sermons. In the pulpit he was the greatest Anglican preacher of his time, and one of the most popular. To a voice of wonderful range and power he added a striking appearance. His *Life of Pusey* was not quite finished when he died. See Oxford Movement; Preaching; consult *Life and Letters*, J. O. Johnston, 1904; *Life*, G. W. E. Russell, 1905.

Lidford, OR LYDFORD, LAW. Term denoting trial after execution, farcical injustice, as expressed in the old English proverb, "First hang and draw, then hear the cause by Lidford law." The allusion is to the summary procedure of the stannaries or tin mines courts, Lydford, on the W. edge of Dartmoor, having been formerly the chief town of the stannaries. A somewhat similar reputation attached to the justice obtaining at Halifax and at Jedburgh. See Jedburgh; Lynch Law.

Lidgett, JOHN SCOTT (b. 1854). British nonconformist minister. Born at Lewisham and educated at Blackheath and at University College, London, he was for 15 years a Wesleyan circuit minister, but in 1891 helped to found a settlement in Bermondsey, of which he became warden. He was president of the National Free Church council, 1906, of the Wesleyan conference, 1908, and first president of the Methodist Church after the union of 1932.



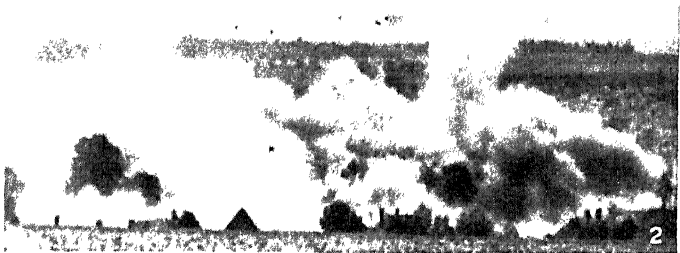
Lidice, Czechoslovakia. 1. The village of Lidice as it was before its extermination by the Germans. 2. The village being burned to the ground, 1942. 3. Commemoration ceremony on the 4th anniversary of the tragedy. The cross was erected by the Russians beside the mass grave of the town's executed inhabitants

Editor of the Methodist Times, 1907-18, in 1911 he became joint editor of the *Contemporary Review*. He led the Progressive party on the L.C.C. from 1918 to 1928. Member of the court of the university of London 1929-41, he was vice-chancellor 1930-32. In 1933 he was made C.H. He published *The Christian Religion*, 1907; *God, Christ, and the Church*, 1927; *Methodism in the Modern World* (with B. H. Reed), 1929; *The Idea of God and Social*

Ideals, 1938; *God and Man*, 1944. His *Reminiscences* appeared in 1928.

Lidice. A mining village of Czechoslovakia, in the Kladno coalfield, c. 20 m. W. of Prague.

It was razed to the ground by the Germans, June 10, 1942, its name removed from the official records, and its inhabitants dispersed; 192 men were murdered, 196 women taken to concentration camps, where 43 died and seven were gassed, and 105 children were carried away for "suitable upbringing." The reason given was an assertion that Lidice had harboured the killers of Heydrich (*q.v.*).



Mexico, China, Cuba, Brazil, S. Africa, and other countries also took the name. Quebec named a county Lidice. Pron. Lid-itsi. See Izasky; Oradour.

Lido (old Ital., shore). One of a chain of sandbanks separating the lagoon of Venice from the Adriatic. The Lido is 8 m. long and $\frac{1}{2}$ m. wide, and at the N. end is the fort of San Niccolo, with the adjoining Protestant cemetery in which are the graves of many prominent English. Early in the 20th century, the Lido, which is easily accessible by boat from Venice, became popular as a bathing resort. Eventually the name was applied to bathing resorts in different parts of the world. The bathing facilities instituted at the Serpentine, London, by George Lansbury, first commissioner of works in the Labour govt. of 1929-31, are popularly known as the Lansbury (or Lansbury's) Lido.

Lie, JONAS LAURITZ EDEMI. (1833-1908). Norwegian novelist. Born at Eker near Drammen, on

President Benes conferred the Czech war cross on the village. Karl Frank (*q.v.*) was hanged as the man responsible for the crime, May 22, 1946; six members of the Gestapo were executed April 24, 1947.

Near the old site the foundation stone of a new village of Lidice, to be built to plans prepared at Columbia university, was laid June 15, 1947, at a ceremony attended by British miners and other foreign guests. On the old site stands a small dignified monu-

Nov. 6, 1833, he became a practising lawyer, but soon found his vocation to be literature. His first books—*Poems*, 1866, and a novel, *The Visionary*, 1870—won for him recognition as a writer of importance. Among his novels may be cited *The Pilot and His Wife*, 1874; *The Family at Gilje*, 1883; *The Commodore's Daughters*, 1886; *Niobe*, 1894; and *The Fairy Children*, 1903. His successful play, *Grabow's Cat*, was performed in 1880, and he also published collections of short stories. He died July 5, 1908.



Justus Liebig

Lie, TRYGVE (b. 1896). Norwegian politician. Born July 16, 1896, at Grorud, near Oslo, and educated at Oslo university, where he obtained his degree in law, he was appointed secretary to the Norwegian Labour party in 1919 and legal adviser to the coun-



Trygve Lie,
Norwegian politician

try's trade union federation in 1922. He became minister of Justice in 1935 and of Trade, Industry, and Shipping in 1939. In 1941 he was minister of Foreign Affairs in the Norwegian government in exile in London, a post which he held until his election as sec.-gen. of the United Nations in 1946. *Prom. Lee.*

Liebermann, MAX (1847-1935). German painter, born July 20, 1847, in Berlin. Influenced by Belgian painters at the Weimar art school, he went to Barbizon in 1873 and developed a style which led to Impressionism in the manner of Degas (*q.v.*). In Holland he became an admirer of Josef Israels; and while in portraiture and etching he showed a strong personality of his own, many of his landscapes reveal the influence of both masters. His work is in galleries at Vienna, Florence, Hamburg, Cologne, Berlin, Munich, Frankfurt, and New York. Liebermann founded in 1898 the Berlin "secession" school, and was president of the Prussian academy of art 1920-32. A member of the order *Pour le Mérite*, he remained the leading figure in German

artistic life until dismissed from his posts, as of Jewish origin, by the Nazis.

Liebig, JUSTUS, BARON VON (1803-73). German chemist. Born at Darmstadt, May 12, 1803, the son of a manufacturer of colours, from his earliest years he had access to a chemical laboratory. Apprenticed to a pharmacist at Heppenheim, he studied all the chemical treatises he could obtain. In 1819 he went to Bonn to study chemistry. After graduating at Erlangen he went to Paris and attended the lectures of Gay-Lussac, Thénard, and Dulong.



Justus Liebig

In 1824 he was appointed professor of chemistry at Giessen, was created a baron in 1845, and in 1852 accepted the chair of chemistry at Munich, which he held until his death, April 18, 1873. Liebig introduced many improvements in chemical apparatus, his combustion furnace, potash bulbs, and condenser being best known. He discovered hippuric acid, aldehyde, chloral, and chloroform, and investigated many organic chemicals. His *Familiar Letters on Chemistry* revolutionised agriculture and nutrition, leading to increased productiveness of the soil by the use of fertilisers; and he gained world fame for his inventions of meat extract and baby food.

Liebknecht, WILHELM (1826-1900). German socialist. Born at Giessen. March 29, 1826, he was educated there and at Berlin and Marburg. On the outbreak of the revolutions of 1848, being then in Paris, he led some volunteers to Baden, and after a vain



Wilhelm Liebknecht,
German Socialist

attempt to establish a republic, made his way, after many adventures, to London, where he fell under the influence of Karl Marx. At the amnesty of 1861 he returned to become editor of the *Norddeutsche Allgemeine Zeitung*, 1862. A staunch Socialist and a bitter opponent of Bismarck, he was banished from Prussia in 1865, and, settling in Leipzig, was in

1872 imprisoned for two years for libelling the chancellor. Whilst in gaol he was elected to the Reichstag. Editor of *Vorwärts* from 1890, he died Aug. 6, 1900.

His son Karl Liebknecht (1871-1919) became an outspoken opponent of militarism and was expelled from the Reichstag and imprisoned during the First Great War. After the armistice he and Rosa Luxemburg, advocating extreme revolution, started the Spartacist rising in Berlin, but Liebknecht was arrested, and while trying to escape from his guards was shot dead, Jan. 15, 1919.

Liechtenstein. Small independent principality in Central Europe. It extends along the right bank of the Rhine opposite the Swiss canton of St. Gall, which bounds it W., the Rhätikon range separating it S. from the canton of the Grisons, and the Austrian province of Vorarlberg bounding it N. and E. The N. frontier is about 14 m. S. of Lake Constance. Liechtenstein is about 15 m. long by 6 m. wide, with an area of 62 sq. m. The valley of the Samina, a tributary of the Ill, is separated from the rest by a range of hills. The rly. from Buchs to Feldkirch crosses the state. Industries include agriculture, weaving, and embroidery, and one of the principal exports is postage stamps.

During 1876-1918 in a customs union with Austria-Hungary, and neutral during the First Great War, Liechtenstein joined the Swiss economic and currency system in 1924. It was paid fees and taxes for the grant of its nationality, or of its privileges as the seat of international financial and industrial companies. Its rulers having possessed huge estates in Austria, Czecho-Slovakia, etc., the inhabitants' taxation remained insignificant. Prince Francis Joseph II (b. Aug. 16, 1906), a ruler of independent mind, made a living for himself, before inheriting his crown in 1938, in a New York stockbroker's firm. By negotiations he managed to avert Nazi infringements upon his country's independence, with slight concessions.

The house of Liechtenstein, named after a castle near Modling in Lower Austria, was known from 1140. It split into two branches, one of which died out in 1712. The other in 1719 created the present principality by joining the counties of Vaduz and Schellenberg. It belonged 1806-14 to the Rhenish Federation, 1815-66 to the German Confederation. The

capital is Vaduz. A mild climate and the beauty of the mountainous setting made Lichtenstein a tourist centre in recent years. Pop. 11,138.

Lied (Ger., a song). German song set to music. It differs from the ballad in that the music describes more definitely the sentiment of the lyric. As a rule, it is of a comparatively simple nature, exciting sympathy rather than wonder. It is sometimes used to denote an instrumental piece of a cantabile character. The plural form is *Lieder*.

Lieder ohne Worte (Ger., songs without words). A title first used by Mendelssohn for a collection of six short pieces of a more or less lyrical character for the pianoforte. Published concurrently in London and Berlin in 1832, the English edition bore the title *Original Melodies for the Pianoforte*, the German name being adopted as the pieces waxed in popularity. In all, six books of *Lieder ohne Worte* were published in Mendelssohn's lifetime, two others being brought out posthumously. For the most part the pieces have no separate titles, the exceptions being Nos. 6, 12, 18, 23, and 29. One or two others have received names from the public, e.g. *Spring Song* for No. 30, and some imaginative editors have completed the list. Since Mendelssohn's time, pieces of a similar character have appeared, either with the German title or its French or English equivalent.

Lie Detector. Mechanical device developed in the U.S.A. and designed to establish whether or not a person is speaking the truth.

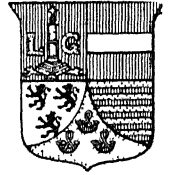
a pneumograph, which records changes in breathing, and a sphygmograph, which records the pulse rate and the blood pressure. It is claimed that anyone consciously lying betrays the fact by recordable variations in pulse rate and blood pressure. The lie detector has been admitted as evidence in a few American courts.

Liège. Province of Belgium. Bounded on the E. by German territory, it consists chiefly of hilly country, especially S. of the Meuse, which flows through the prov. Other rivers are the Ourthe, Vesdre, Hoyoux, and Geer. The S.W. corner is part of the hilly district known as the Condroz. Liège is the capital, other towns of importance being Seraing, Verviers, Huy, Dison, Herstal, Eupen, and Malmedy. Area, 1,525 sq. m. Pop. est. 928,941.

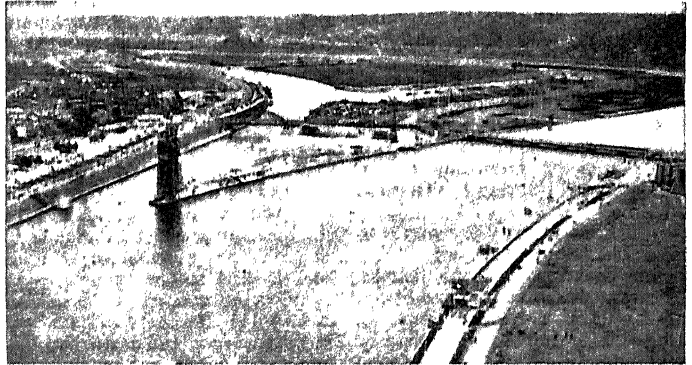
Liège, or **LIÈGE** (Flemish, Luik). The fourth largest city of Belgium, and capital of the prov. of the same name, and chief town of the Walloon half of the country. Situated on both sides of the Meuse and of its tributary the Ourthe, and surrounded by the

Today the city is mainly industrial, but there are also a fine university (founded 1817); schools of commerce; diplomatic and ecclesiastical colleges; academies of music and art; botanical gardens; several good museums; and an observatory. A number of learned societies flourish there. There are many fine hospitals and medical research centres. Industry is based on the great coalfields in the vicinity. Locomotives, automobiles, bicycles, and tools and machinery of all kinds are manufactured, as well as (before the Second Great War) armaments. Other manufactures include textiles, paper, glass, and chemicals. Liège is one of Belgium's main rly. centres.

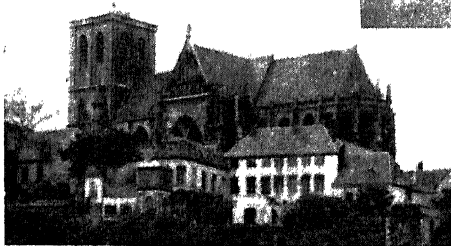
Official pop. figures are misleading. Apparently stationary, or even slightly decreasing since 1925, at 160-170,000, or with (suburbs) 235-250,000 in fact, combined with the administra-



Liège arms



Liège, Belgium. Air view showing the junction of the river Meuse with the Albert canal. On left, the church of S. Martin



One type consists of an electrical machine incorporating an amplifier which actuates a stylo moving across graph paper. The man under examination has electrodes fixed to his hands and connected to the detector. It is maintained that the nerves of a person not speaking the truth will alter the frequency of the current in the detector and so cause the line on the chart to vary. Another device includes

hills of the Ardennes, it stretches along a valley, and is surmounted on the N. by the citadel, formerly of great military importance. Although often destroyed and pillaged in the course of history, Liège preserves several fine old buildings, e.g. S. Paul's cathedral (A.D. 966, enlarged 13th-16th cents.), S. Martin (962, enlarged 1542), S. Dionysius (987), S. Bartholomew (1015), Holy Cross (1015), S. James (1016); also an 11th cent. town hall, a 15th cent. bridge, 16 cent. law courts, and many fine houses recalling the time when Liège was an episcopal see.

tively autonomous but virtually incorporated districts of Herstal, Ans, Tilleur, Seraing, Ougrée, Angleur, Chénée, Grivegné, etc., the pop. figure is approx. 500,000. Pop. of prov. approx. 1,000,000.

Liège was founded in the 8th cent. on the tomb of S. Lambertus by his successor S. Hubertus, and became a bishopric ranking as a principality of the German Empire at the end of the 11th cent. (confirmed in the 14th). Owing to its enlightened bishops Liège became famous as early as the 11th cent. as a place of learning. In the later struggles between the citizens and their ecclesiastical rulers it was conquered by Charles the Bold allied with the bishop, 1467;

and five times by the French between 1675 and 1784. The latter conquest ended the German principality, which was included in the new kingdom of the Netherlands by the congress of Vienna, though still as a separate principality. In 1830 it joined Belgium.

Liège was fortified in 1891 and presumed impregnable. At the outset of the First Great War it presented an apparently formidable barrier to the German advance into Belgium. On Aug. 5, 1914, the Belgian commander Leman (*q.v.*) refused a summons to surrender, whereupon five of the twelve forts surrounding the town were bombarded by howitzers. Infantry assaults in close formation were repulsed with heavy losses. By Aug. 16 after the Germans had used 17-in. artillery, the last forts had fallen, and the Germans entered the city. The delay undoubtedly saved the French army from disaster and Paris from capture. Remaining in German occupation throughout the war, Liège suffered heavy economic damage but was spared large-scale material destruction.

In the Second Great War, Liège was overrun by German mechanised units within the first three days of their attack in May, 1940, though the vast fortifications, including Eben-Emael (*q.v.*) held out for several days longer. Thus again the city was saved from any immediate devastation, though during the German Ardennes offensive of Dec., 1944, loss of life and property was considerable, and German flying bombs contributed to the distress. The city was liberated by troops of the U.S. 1st army, Sept. 8, 1944. Liège's post-war recovery was remarkable, and the city soon regained its position as a centre of European importance.

Liegnitz (Pol. Legnica). Town of Silesia, under Polish rule from 1945, at the junction of the Katzbach and the Schwarzwasser, 41 m. by rly. W. of Wrocław (Breslau). Capital of the duchy of Liegnitz for 500 years after 1164, the old town was ringed with pleasant promenades on the line of the fortifications. It contains the restored 14th cent. Protestant church of SS. Peter and Paul, with early bronze font and two brick towers of the 15th century. The old castle is used for public purposes. There is a museum with a collection of armour, etc. The manufactures include textiles, (chiefly wool), leather, pianos, cutlery, and machinery. Market gardening is an



Liepāja, Latvia. Greek Catholic Marine Cathedral, consecrated in 1903, on the Naval Harbour

important local industry. Liegnitz became Prussian in 1742. Near here, in 1241, the Mongols overthrew the Poles, and in 1760 Frederick the Great defeated the Austrians. Pop. 76,544.

Lien (F. *lien*, tie). Term used in English law. It describes the right to retain property until some debt in claim is paid. Thus an innkeeper has a lien on a lodger's property until the bill for board and lodging is paid. A workman, *e.g.* a tailor who has mended a coat, may retain the thing he has been working on until the work is paid for. A carrier may retain the goods carried until his charges are met; and there are many other instances—notably a solicitor's lien on all his client's papers for his bill. But as a rule a lien cannot be claimed for a general balance of account. For example, if an overcoat is sent to the tailor's to be mended, he can refuse to deliver it up until the mend is paid for; but he cannot refuse to hand it over until a bill previously owing has been paid.

Liepāja (Ger. Libau). Latvian seaport and the second largest city in the S.S.R. It is in Courland on a sandy strip of land between the Baltic and the Lake of Liepāja, 150 m. by rly. W.S.W. of Riga. There are iron foundries, breweries, chemical works, timber mills, and agricultural machine factories; the chief exports are cereals, flax, spirits, oil cake, flour, and timber. The excellent harbour is free from ice nearly all the year. Liepāja is also a bathing resort, and there are sulphur springs in the neighbourhood. In the 13th century it belonged to the Knights of Livonia. It came into Russian possession in 1795. In 1915 it was captured by the Germans, who made it a naval

base, but in 1921 it became a free port, having been for a time the seat of government. Bombed by Germans and Russians in the Second Great War, the town suffered considerable damage. It was liberated only when the Germans isolated in Courland surrendered, May 13, 1945. Pop. 57,098.

Lierre (Flemish, *Lier*). Town of Belgium, in the prov. of Antwerp. It lies on the river Nèthe, 9 m. by rly. S.E. of Antwerp, and is a rly. junction. It is a busy silk manufacturing centre, and is notable for its large Gothic church of S. Gommaire, built 1425–1557. There is a 14th century belfry. Lierre formed one of the outer forts of Antwerp, as designed in 1879. Pop. 28,552. *See* Antwerp.

Liestal. Town of Switzerland. The capital of Basel-Land, or Bâle-Campagne, it stands on the river Ergolz, 9 m. by rly. S.E. of Basel. Its 15th century town hall preserves the golden cup of Charles the Bold, found in 1477, after the battle of Nancy. There are several medicinal springs near. The chief manufactures are gloves and ribbons. Pop. 6,700.

Lieutenant (Fr. *lieu*, a place; *tenant*, holding). Title denoting a rank in the navy, army, and air force. In the British army a lieutenant is next below a captain; in the navy next below a lieutenant-commander; in the R.A.F. a flight lieutenant (*q.v.*) is next below a squadron leader. An army lieutenant corresponds in rank to a sub-lieutenant in the navy, and to a flying officer in the R.A.F.

In the army a second lieutenant is the lowest rank of officer; the badge is one star on the epaulette, and when promoted to full or first

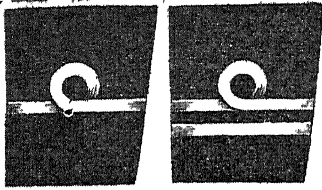
lieutenant, the badge of rank is two stars. In the navy there are various branches of lieutenant, *e.g.* ordinary, engineer, surgeon, carpenter, and instructor lieutenant. In 1947 pay of a male army lieutenant was fixed at £310 per annum, rising to £347 after five years' total service; that of second lieutenant at £237 5s. A second lieutenant is automatically promoted after 18 months. Qualification pay may be admissible also, plus marriage



Lieutenant. Shoulder badge of 2nd lieutenant, army

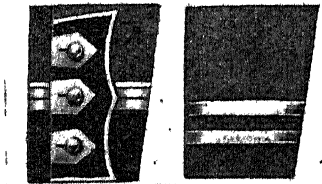


Lieutenant. Shoulder badge of 2nd lieutenant, army



Lieutenant. Sleeve badges of sub-lieut., navy, on left. Lieut., navy, right

allowance of £228 annually. The pay of a naval lieutenant, after six years' service, is £1 6s. a day, after four years £1 4s.; and 17s. on pro-



Lieutenant. Sleeve badges of lieut., royal marines, left, and lieut., R.A.F., right

motion. Men are gazetted to the rank of second lieutenant in the army after passing out of a military college, though in both Great Wars thousands of the rank and file were given commissions. Lieutenant replaced subaltern as a rank of the W.R.A.C. in 1950.

Lieutenant-Colonel. Title denoting a rank in the British army next below that of a colonel. It



Lieutenant-Colonel. Shoulder badge

originated in the days when the colonel of a regiment was allowed to nominate someone to act for him, such being his lieutenant. In the British army today a battalion of infantry, a regiment of cavalry, and a regiment of artillery are each commanded by a lieutenant-colonel. The rate of pay varies somewhat in the different branches of the service, but the ordinary pay of a male lieutenant-colonel was in 1947 fixed at £867 a year, rising to £1,049 after six years. An extra sum, 10s. a day, in a regiment of household cavalry or a battalion of foot-guards, is paid as command pay. Marriage allowance is £274 annually. A lieutenant-colonel must retire at 55. The corresponding rank in the navy is commander, and in the R.A.F. wing commander. Lieutenant-colonel replaced chief commander as a rank of the W.R.A.C., 1950.

Lieutenant-Commander.

A title denoting a rank in the British navy. It is below commander and above lieutenant and ranks with major in the army and squadron leader in the R.A.F. There are engineer, surgeon, pay-master, and instructor lieutenant-commanders. The pay is £1 12s. per day on promotion, £1 16s. after four years, and £2 2s. after ten years. These rates do not include marriage and other allowances, while a few specialists receive a higher basic rate. See Royal Navy.



Lieutenant-Commander. Sleeve badge

Lieutenant-General. In the British army the rank below that of full general. The equivalent

rank in the navy is vice-admiral, and in the R.A.F. air-marshal. The rank is common to most armies. In the U.S.A., up to the time of the Civil War, it had been conferred only on George Washington. It was revived in 1864 and conferred on Grant among others. It lapsed in 1888, was revived in the First Great War, and in 1920 again disappeared.

In the British army the pay of this rank varies slightly between different branches, but in 1947 the basic rate was fixed at £2,463 per annum, to which was added a further sum of £365 as marriage allowance.



Lieutenant-General. Shoulder badge

LIFE: ITS NATURE & DEVELOPMENT

Julian S. Huxley, F.R.S., M.A., D.Sc., distinguished Biologist and Zoologist

The main properties of life revealed through its history and existing characteristics are lucidly explained in this article, which summarises the information in a group of articles on biology. See Bacteriology; Botany; Embryology; Evolution; Genes; Heredity; Mendelism; Sex; Virus, etc.

Life is the word used to describe the properties of living matter. The most essential of these properties is self-reproduction or self-copying, for the basic units of living matter have the power of producing a copy of themselves out of less complex materials. These basic living units, it is now almost certain, are what the geneticists call the genes—the particles out of which the hereditary constitution is built up. Each gene can be regarded as a "super-molecule," containing many hundreds of atoms. Each gene differs from every other in its chemical composition or arrangement.

It has been suggested that some at least of the viruses are equivalent to single genes; but whether this be true or no, it seems probable that living matter when first evolved on earth was in the form of single genes, certainly in a watery environment. Conditions at this period (something over 1,000 million years ago) must have been wholly different not only from those of earlier periods, when the temperature, for instance, was too high to permit the existence of any organic compounds, but also from those of later ages, when life was already established. In particular, the unique conditions which favoured the building-up of the extremely complex organic sub-

stances capable of self-reproduction must also have produced numerous other compounds almost as complex, which were, however, not truly alive. Thus the home of the original life on earth must have resembled a warm soup. The organic substances it contained could not decay, since no bacteria had yet evolved, and were accordingly available as sources of raw material—in other words food—for the small fraction of the whole which was alive in the sense of being endowed with the power of self-copying.

MUTATION. The self-copying process, which in a few cases gives more or less inaccurate copies, has been much studied in the heredity of higher animals and plants, and is known as genemutation. In spite of intensive study, it is not yet known exactly in what it consists—presumably in slight alterations of chemical structure in one part of the gene, either by addition, subtraction, or rearrangement of atoms or groups of atoms. The inaccurate copy, or mutant gene, is also capable of self-copying so that the gene comes to exist in two distinct forms, the original and the new or mutant type, both self-reproducing.

Mutations have been produced experimentally on a large scale, by means of bombardment with ultraviolet and X-radiation and with

high-speed intra-atomic particles, and, more recently, by chemical treatment (mustard gas and phenol have proved effective). Mutations also occur "spontaneously," though with much lower frequency; this spontaneous mutation is increased in amount by higher temperatures, and appears to be due chiefly to submicroscopic accidents, when parts of genes are, as it were, jolted into new arrangements (rather as individual atoms may be jolted into new arrangements of their electrons with emission of quanta of, e.g., light-energy). There are other kinds of mutations as well—the addition or subtraction of whole chromosomes or sets of chromosomes, or the rearrangement of parts of chromosomes. These also may produce definite changes in the characters of the organism. In any case, each mutation is a single unpredictable event, a quantum of evolutionary change.

Laws of Genetics

In all probability sex was absent from the earliest forms of life. It must, however, have evolved quite soon, and from then on new possibilities of variation were available. Sexual reproduction consists of the union of two separate hereditary constitutions, with the subsequent redistribution of their component genes to produce all possible combinations.

Mendel's laws and other laws of genetics, such as those concerning linkage, result directly from the nature of the mechanism of heredity and sexual reproduction. They are all statistical laws (like Boyle's Law or other laws in physics) which represent the average result of a large number of single "chance" events. In a male rabbit derived from a cross between a coloured and an albino strain, any of his sperms has an equal chance of carrying the "coloured" or the "albino" gene. If you take enough of them the proportions will be extremely close to 50 : 50, but with small numbers there are likely to be considerable deviations from equality.

The most important evolutionary results of sex are twofold. In the first place life has been provided with a mechanism by which a number of mutant genes, even if slightly unfavourable, may be conserved in the hereditary constitution. These then constitute an evolutionary reserve of variations which may be utilised if conditions change, or if new mutations arise that, in combination with some of the reserve mutants,

produce favourable gene-combinations; for sex also provides a mechanism through which successive favourable mutations may be combined in the same stock, through the process of Mendelian recombination. This enormously speeds up the possibility of favourable change. Without sex, two favourable mutations will be combined only if they occur in the same strain; as each mutation is a rare event, this will be an extremely rare event. With sex, however, two favourable mutations occurring in separate strains can be combined within two generations after crossing.

Process of Natural Selection

From the two fundamental properties of living matter—self-reproduction and mutation—natural selection automatically follows. This principle or agency of evolution was first enunciated by Darwin, but today it can be much more clearly formulated, and the methods of its operation more accurately analysed.

The genes (in conjunction with the conditions of the environment) determine the characters and properties of the developing animal or plant. In the great majority of cases the properties conferred by the mutant form of the gene will be either more or less favourable to the organism than those conferred by the original form. If so, a process of natural selection will occur, through which the numbers of the less favourable genes in the population will be reduced, those of the more favourable will be increased. In most cases this process will be continued to its conclusion, whereby the mutant gene is either entirely eliminated because it is unfavourable, or else, if favourable, entirely replaces the original gene in the constitution of the species. Alternatively, the mutant gene may be more favourable in slightly different conditions, in which case the population may become differentiated into two groups, one in the original environment, containing only or mainly the original gene, the other in a new environment, containing only or mainly the mutant gene. Selection, operating on any kind of heritable variation, whether due to new mutation of genes, of chromosomes, or of chromosome-sets or to recombination, will produce change in non-sexual forms, but its operation in sexually-reproducing organisms can be much quicker.

Natural selection is a resultant of what Darwin called the struggle

for existence—the fact that on the average more young animals or plants are produced than can survive. The struggle involved in selection between variants is not, except in a small minority of cases, an actual struggle. Usually it is a matter of rather more of one sort than of another growing up to maturity, or of one type producing on the average slightly more numerous or slightly more vigorous offspring than another. In general, what is involved is differential reproduction of types in the next generation; and quite a small difference—e.g., that between 99 of one type and 100 of another—will lead in a comparatively small number of generations to the elimination of the less favoured type, or at least to its reduction to the status of a very rare variant, while the favoured type has become normal for the strain.

Selection and Evolution

Selection may act in quite different ways according to circumstances. Thus in stable conditions and as between already specialized forms it will act as a stabilising agent and discourage change; but when the environment is itself changing, or when the organism on which it is acting has not reached the limit in its specialisation, it will promote change. In its change-producing capacity, it has been the main factor in causing life to evolve.

ORGANIC EVOLUTION. When the new is selected as against the old, change occurs—in other words, life evolves. Evolution also occurs in systems which are not alive. Thus stars, solar systems, and galaxies evolve in a characteristic way; and it is legitimate to speak of the evolution of a river or of a mt. system. But organic evolution, or the kind of evolution which occurs in life, is evolution *par excellence*, and differs from evolutionary processes in non-living systems in three essential ways: (1) owing to self-reproduction, there is organic continuity between all the products of the process; (2) owing to natural selection (and especially to natural selection in sexually-reproducing forms), it is much more rapid than inorganic evolution; and (3), again owing to natural selection, it produces results which would, in inorganic evolution, be infinitely improbable. Life, through selection, tends on the average to adjust itself better to its environment.

The early stages of organic evolution remain largely hypothetical, since virtually no fossil

remains have been discovered from about half of the 1,100 million years or so which, on radio-active evidence, must have elapsed since life originated. On indirect evidence the broad lines of early evolution were probably as follows. First, the chemical structure of living matter must have grown more complex, largely owing to the incorporation of more kinds of metallic elements. Of these, over 20 are known to occur in all organisms investigated, mostly in scarcely detectable traces, though sometimes (as with the iron in human red blood-corpuscles) in larger, though still small, amounts. These seem to have the function of facilitating particular vital processes (as iron does respiration). Secondly, the number of different genes in the hereditary constitution must have increased (presumably by mutation in one of two or more duplicated genes). Thirdly, if naked genes were the original sole constituent of life, they must have surrounded themselves with other substances, produced by their own activity, which rendered the organism more efficient. Thus most bacteria appear to consist of genes embedded in a mass of non-genic protoplasm, together with granules or non-living reserve food, etc., the whole surrounded by a protective sheath and equipped with tiny vibratile swimming hairs. At a later stage the genes are grouped in linear formation into definite chromosomes and segregated inside a nucleus, which is separated by a membrane from the rest of the living substance or cytoplasm. Such an organization is called a cell.

Main Types of Life

Meanwhile, life had evolved the main types of utilisation of raw materials. The green plant type utilised the green colouring matter called chlorophyll to build up new living matter out of simple inorganic substances; the animal type utilised other living organisms as food; the fungi were restricted to organic substances produced by decay, simpler than those needed by animals, but more complex than the inorganic substances used by green plants; and the bacteria specialised in various ways of nutrition, some being parasitic, others capable of fixing atmospheric nitrogen, etc.

One important step, taken independently by both animals and plants, was the union of many cells to form a single organism. This made it possible for life to

achieve greater size, greater complexity, and division of labour between the parts of the body. Among many-celled animals, a number (about 12) of major lines or phyla must have early been evolved, each with its own characteristic structural plan. The most important of these are the sponges (2-layered, without mouth); the coelenterates (2-layered, with mouth—sea-anemones, jelly fish, etc.); the flatworms (3-layered, like all further forms, with mouth, but with no anus—flukes, tapeworms, etc.); the echinoderms (like all further forms, with mouth, anus, and true body-cavity, but with radiate structure—starfish, sea-urchins, etc.); the annulates (with body made up of segments and ventral solid nerve-cord—segmented worms, leeches, etc.); the arthropods (similar to the annulates but with hard external skeleton and many-jointed limbs—crustaceans, spiders, insects, etc.); and the chordates, including the vertebrates (with tail, partially segmented body, and dorsal hollow nerve-cord—sea-squirrels, lampreys, fish, and other backboned animals).

Evidence from Fossils

All of these except the chordates have been found as fossils from the early Cambrian period, some 500 million years ago. From this period onwards, fossils are abundant, and they, in conjunction with indirect evidence drawn from comparative anatomy and embryology, enable us to reconstruct the general tendencies of life in the remaining 500 million years or so of its history. The two main tendencies discernible have been called adaptive radiation and the evolutionary succession of dominant groups.

ADAPTIVE RADIATION. This is the process by which any newly-evolved group of animals (or plants—but the fossil record is here much less complete) is seen to break up into a number of lines each adapted to some one main mode of life. Each of these lines gradually becomes more and more specialised for its main mode of life, meanwhile itself breaking up and diverging into a number of sublines adapted to particular ways of life within the main mode.

Thus the higher or placental mammals during the Cainozoic era radiated adaptively to produce, among others, the flesh-eating carnivores; the vegetarian, mainly ruminant, even-toed ungulates; the non-ruminant odd-toed ungulates; the huge trunked ele-

phants; the flying bats; the marine aquatic whales and porpoises; the omnivorous or insect-eating insectivores; and the arboreal primates (lemurs, monkeys, apes, man). Among these, the carnivores themselves, for instance, split up into the cats, the mongooses and civets, the hyaenas, the dogs and wolves, the bears, the weasels, the badgers, the otters, the seals and sea-lions, each adapted to a particular kind of flesh-eating life, and each again breaking up further into still smaller adaptive branches—the cats, for instance, into lions, tigers, wild cats, lynxes, leopards, etc.

The reptiles of the Mesozoic era also underwent adaptive radiation, producing flying forms (ptero-dactyls), marine aquatics, large carnivorous forms (tyrannosaurus, etc.), large herbivores (giant herbivorous dinosaurs), armoured tortoises, active lizards, limbless snakes, etc. The general result of the two radiations were similar—to fill various ways of life available to large air-breathing vertebrates; but the details are different: thus, the mammals produced only one fully aquatic marine line (the cetaceans), the reptiles at least three (the ichthyosaurs, plesiosaurs, and mosasaurs).

After a time to be reckoned in tens of millions of years, the various adaptive lines of a radiation cease to show further major change because they have become as fully specialised as is possible—e.g., once the horse family had reached the stage of one toe per foot and of high-crowned teeth with complex grinding surfaces, natural selection could not push them further along the road of specialisation for rapid running in open country, and for utilising grasses as chief food: all that remained was to adapt the type to local conditions, in the shape of true horses, asses, and zebras.

Emergence of Dominant Types

When the specialisations of adaptive radiation have thus come to a dead end, a new dominant type of animal usually emerges sooner or later which will undergo adaptive radiation in its turn, while many of the branches of the old type become extinct or are reduced in numbers. The classical example of this is the replacement of the reptiles by the early mammals as dominant type at the end of the Mesozoic era; but the process has happened repeatedly in many groups.

The new dominant group is never more specialised for a

particular mode of life than the old, but registers an all-round improvement in construction (*e.g.*, constant temperature and secretion of milk in mammals, as against their absence in reptiles).

OTHER FEATURES OF EVOLVING LIFE. One feature of evolving life is generally called adaptation—the detailed adjustment of the organism to its environment and mode of life. Constant improvement of adaptation is a necessary result of the pressure of natural selection. Thus the entire structure and physiology of birds is a remarkable adaptation (or set of adaptations) towards efficient flight; the amazing resemblance of various animals to their surroundings, *e.g.*, of the butterfly *Kallima* to a dead leaf or of many geometrid moth caterpillars to twigs, is an adaptation to escape sharp-eyed enemies; eyes are adaptations for vision; the construction of the respiratory centre in the human brain, by which a minute increase in the amount of CO_2 in the blood causes more rapid breathing, is one of numerous adaptations for keeping the chemical composition of the blood constant; the streamlined form of porpoises, ichthyosaurs, many fish, and some cuttlefish, is an adaptation to swift movement in water; and so forth.

Natural Selection's Improbabilities

It has often been argued that chance, in the shape of the automatic natural selection of those random mutations which happen to be advantageous, could not possibly produce detailed adaptations such as the resemblance of the *Kallima* butterfly to a leaf, or complex adaptive organs, involving the co-adaptation of many separate parts, like the eye. This, however, is erroneous. Natural selection is a necessary consequence of the properties of life; and it generates improbabilities of a very high order. It can do this because, through differential survival of self-reproducing variants, the rare accident is made common property. The more complex an adaptation is, the better proof it is of the power of natural selection.

SPECIATION. All life is continuous in the sense that all living conditions are derived from the living substance of other living creatures, and that if it were possible to trace back the lines of descent of all the existing and extinct forms of life, they would converge, through an unbroken continuity of self-reproducing living matter, on an original common ancestor.

But this evolutionary continuity is at any one time always broken up into discontinuity. For the practical purposes of existence, life is in the form of the unit-groups called species. A species is a group of individuals with common characters differing from those of other species, and either actually or potentially capable of regular and fully fertile interbreeding in nature with each other, but not with individuals of other species. They are the units of evolution.

Isolation and Differentiation

Species exist because of another property of evolving life—the tendency to split up into discontinuous interbreeding groups. The splitting always comes about as the result of isolation. The commonest form of isolation is geographical. Thus animals and plants on islands have almost without exception evolved into new species. The grouse of Britain, isolated by land subsidence from those of the Continent, became the red grouse, distinct from the Continental willow grouse. When a species extends over a very large area, the two end-forms may become so different that they behave as fully distinct species in refusing to cross, although they may be connected by a chain of forms, each fertile with its neighbours.

Or the isolation may be ecological—*i.e.*, one part of a species becomes restricted to a different kind of habitat from the rest, or even to a distinct type of food-plant, or host. Thus, certain American mice live only in woodland, while their nearest relatives live only in open country, so they do not normally interbreed even though living quite close to each other. Again, the pest called apple-fly exists in two forms, one feeding on apples, the other on hawthorn, which, though almost indistinguishable to the eye, are in point of fact distinct species, as they cross with difficulty.

Or the isolation may be genetic—*i.e.*, part of a species may come to have a hereditary constitution which renders it incapable of fertile crossing with the remainder. The commonest form of genetic isolation is caused by the doubling of the entire complement of chromosomes. Such tetraploid forms can cross with the normal diploids, but the offspring are more or less sterile.

Once two groups are isolated, they tend gradually to diverge farther and farther from each other. When they live in different environments, this will be due in

the main to natural selection. But in very small isolated populations chance may also step in, even when both live in the same conditions. This is because, in such populations, the question of whether a mutation is entirely lost or becomes established in the whole group will depend very much on accidents of its distribution at the time of reproduction.

The facts of geography, ecology, and genetic structure see to it that life is divided into a large number of species; and, further, the geographical accidents causing isolation, together with the genetic accidents producing non-selective variations in small isolated groups, see to it that the variety shown by species is much greater than would be required on purely selective grounds to adapt each species to its environment. Over a million separate species of animals are known, and thousands more are still being discovered.

IMPROVEMENT THROUGH EVOLUTION. Besides this short-term diversification leading to the production of new species, life also shows long-term trends in its evolution. The specialisations seen in adaptive radiation are one example. The most interesting, however, is evolutionary progress, *i.e.* the trend towards an all-round as against a one-sided improvement in construction and working, which leads to greater control over and independence of the environment, to an increase in the incorporation of experience in life and in its utilisation in behaviour; and does so without leading the stock into an evolutionary blind alley (as happens with all one-sided specialisations), but leaves the evolutionary door open for further progress.

Progress a Continuous Process

Progress is not by any means universal: in fact it is the exception, not the rule. Many lines do not change at all over long periods; others change merely in respect of minor diversification into new species; others exhibit one-sided specialisation which must lead to a stop. Progress is exhibited chiefly in the emergence of new dominant groups, and is to be measured by the properties of the highest forms of life to be found at any one period, not by the average of all life. It does, however, appear to be a continuous process, inevitable so long as the earth provides conditions favourable to life.

The evolution of sense-organs and central nervous systems con-

sisting of nerve-cells makes possible the detailed adjustment of muscular action (*i.e.* behaviour) to sensory stimuli (*i.e.* knowledge of the outer world). Certain types of nervous structure, notably those involved in conditioned reflexes and in learning processes, make possible the adjustment of behaviour to individual experience. Still more elaborate types of nervous structure, namely, those found in the grey matter of the brain, appear to intensify the general mental potentialities which must be inherent in all life, so that higher animals at least are capable of conscious processes of knowing, feeling, and willing which must be similar in quality (though not necessarily in degree) to those which we experience ourselves.

Effects of Evolution

Evolutionary progress includes the improvement of sense-organs, which results in the acquisition by the organism of a greater range and amount of information about the outer world; the improvement of nervous mechanisms for amassing and coordinating information and experience, and for "learning"—*i.e.*, adjusting behaviour to past experience; and the improvement of mental powers (consciousness) on the side of emotion and volition as well as of knowledge, so that life is more able to forecast the probable future course of events and to project its own desires into them by means of purposeful behaviour.

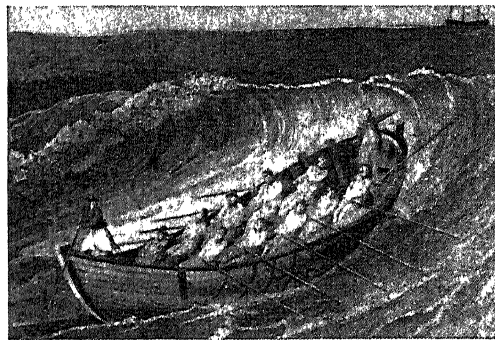
The later stages of evolutionary progress (*e.g.*, from amphibians to reptiles, reptiles to lower mammals, lower to higher mammals) are characterised by a notable increase in size and complexity of brain accompanied by a corresponding increase in complexity of behaviour and, it may reasonably be presumed, in the intensity and range of mental power and consciousness. With the evolution of the placental mammals, the physiological construction of the animal body seems to have been approaching the limit of efficiency, and further advance could be achieved only, or at least best, by improvement of brain and mental powers.

This process culminated in man, in whom conceptual thought and true speech were evolved for the first and only time in the known history of life. This produced a change as radical as that of the evolution of living from non-living matter. Both events led to an immense speeding-up of the rate of change possible in evolution,

through the introduction of new evolutionary methods. The beginning of life led to the appearance of natural selection as chief agent of evolutionary change; the beginning of human consciousness led to the appearance of a cumulative tradition through which the slow and wasteful processes of natural selection can be outstripped by acquiring, transmitting, and adjusting experience. Before this point, mental capacity had been merely one among many factors conducing to evolutionary success; subsequently to it, mental capacity became the basis for progress.

Life. American weekly periodical. It was founded in N.Y.C. in 1883 by J. A. Mitchell and Andrew Miller, as an artistic satirical journal. In 1920 it became the property of Charles Dana Gibson (*q.v.*). Life was purchased by the magazine Time in 1936, appearing in a new format under the editorship of Henry Luce, as a weekly picture magazine. Its circulation rose to over 5,000,000 copies weekly.

Lifeboat. Craft used for saving life at sea. There are two kinds of boat to which the name is popularly given: those carried by ships to be used should the ships have to be abandoned; and those maintained at coast stations ready to be launched to aid ships in distress.



Lifeboat. The first shore-based lifeboat, built at South Shields in 1789

By courtesy of the Royal National Lifeboat Institution

Since the Titanic (*q.v.*) disaster in 1912, British Board of Trade regulations have required all ocean-going ships to carry lifeboats in sufficient number to accommodate the full complement of passengers and crew. Size and type vary from the small, oar-propelled boat of the tramp steamer to the large, mechanically-powered boat of the liner. The liner Queen Elizabeth is equipped with 28 lifeboats, each of steel, 36 ft. long with a beam of 13 ft., and propelled by an 18 h.p. Diesel engine. The boats

are fireproof, practically unsinkable, and have buoyancy tanks. Each takes 145 passengers, and its equipment includes radio telegraphy and direction-finding apparatus, distress flares, oil for calming rough water, and a complete range of charts and navigating equipment. It is provisioned with 2 lb. of biscuits, a tin of condensed milk, another of meat extract, and a quart of water, for each passenger. A distillation plant renders sea water fit to drink. The boat weighs 16 tons loaded.

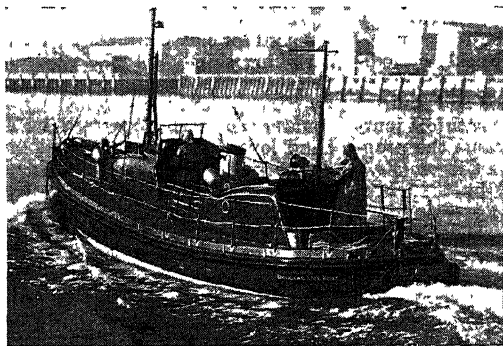
Various types of launching gear are used for clearing lifeboats from a sinking ship. From the Queen Elizabeth the boats are launched by gravity davits controlled by a counterweight and operated by a hand lever. When swung out on davits they run down an inclined rail, and on reaching the water automatically slip their falls. Each boat can be launched in one minute.

Oil tankers carry special lifeboats which can be launched from a burning ship into a sea covered with oil. The boat is of the open cockpit type, 28 ft. long, and consists of two separate steel hulls, the space between them being used as a buoyancy chamber. A deep coaming extends all round the cockpit, which is fitted with a fireproof sliding canopy. Water sprayers, worked by hand-pumps, provide a constant spray over the whole external surface above the waterline. The boat seats 33, and when fully manned and equipped weighs seven tons. It can be propelled by a Diesel engine or by hand levers connected to the propeller shaft through gearing.

Shore-based lifeboats for the assistance of ships in distress are maintained privately or nationally by most maritime countries. The first, described and designed in 1765 by a Frenchman, de Bernières, was never put to practical use. An unsubmersible lifeboat on the lines of a yawl was built in 1785 by Lionel Lukin, a London coach-builder. In 1789 a wreck attended with heavy loss of life off South Shields inspired the offer of a prize for a suitable lifeboat. Henry Greathead won with a model, and with others built the first lifeboat

able to right herself in the event of capsizing. This was stationed at Shields for over 40 years and rescued hundreds.

The modern lifeboat differs from an ordinary boat in three special qualities: she is more strongly built; she can free herself in a few seconds, by flaps or scuppers, of any water which comes on board; and she is fitted with air cases which will keep her afloat even if holes are knocked in both sides and she is completely flooded.



Lifeboat. The Cromer Watson cabin-type lifeboat Henry Blogg. She was built in 1947, is 46 ft. long, and named after a famous lifeboat coxswain

By courtesy of the Royal National Lifeboat Institution

There are two main types of lifeboat, the self-righter with heavy keel and high air chambers at bow and stern, and a broader, more stable boat which, though she cannot right herself, is less likely to capsize. The self-righting principle is now used only in smaller craft. Until 1890, when the first steam lifeboat was built, all were propelled by oars and sails. But with the development of the petrol engine, the lifeboat service found the power suited to its needs. The first motor lifeboats appeared in 1908 and now nearly all are motor-driven, with heavy oil or petrol engines, ranging from 35 to 120 h.p.

In 1947 the Royal National Lifeboat Institution introduced the Watson type of cabin lifeboat. This vessel is 46 ft. long on a displacement of 20 tons, and its two 40-h.p. Diesel engines drive twin screws to give a maximum speed of 8½ knots in a heavy head sea. The engine room is sealed, so the boat can continue running even if heavily flooded below decks. An oil spray is fixed in the bow. The boat carries radio receiving and transmitting sets, a searchlight, a line-throwing gun, and a loud hailer. She can carry a crew of eight and 95 passengers.

Methods of launching lifeboats are determined by the type of fore-

shore, which may allow of a concrete slipway or need launching on a carriage by caterpillar tractor. During the Second Great War an airborne lifeboat was introduced to rescue air crew who had baled out. The best type is 23 ft. 6 ins. long and has a beam of 5 ft. 6 ins. Weighing 1,500 lb. with full equipment, the boat is built of two mahogany skins supported by fabric soaked in linseed oil. It is fitted with buoyancy chambers fore and aft, which are automatically inflated as the boat leaves the aircraft, ensuring self-righting in all weathers. Besides mast and sails, the boat has a 4-h.p. engine giving a speed of 4 knots. Provisions and first-aid equipment, dry clothing, a water filter, and a radio transmitter are carried. The boat is dropped by three or more parachutes. The

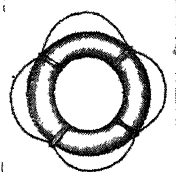
first airborne lifeboat was released operationally in May, 1943, from a Hudson flown by an R.A.F. Air-Sea Rescue squadron and took up the crew of a bomber forced down 50 m. from the British coast.

In the U.K. lifeboats are maintained by the Royal National Lifeboat Institution and supported by voluntary subscriptions from the public and grants from shipping companies. In the U.S.A. they are operated by the Life-Saving Service, which is largely subsidised by Congress. There are eighteen lifeboat organizations in various parts of the world. See Air-Sea Rescue; Merchant Navy; Shipping.

Lifeboat Institution. ROYAL NATIONAL. A British institution founded by Sir William Hilary, 1824, to provide lifeboats and equip stations for saving life from shipwreck on the coasts of the British Isles. It possesses a fleet of over 150 lifeboats, and its crews and helpers on the coast number about 2,000. Except for motor mechanics, full-time paid servants of the institution, the crews are volunteers; but they are rewarded for every occasion on which they go out in the lifeboat, the officers receive annuities when they retire, and dependants of a lifeboatman who loses his life on service are pensioned as if the man had been

a sailor, soldier, or airman killed in action. The institution also rewards others than lifeboatmen who save life. It has given awards for the rescue of over 75,000 lives, a weekly average of eleven. In the Second Great War British lifeboats saved on the average 21 lives a week. *Consult* Storm on the Waters, C. Vince, 1946.

Lifebuoy. Buoyant device for the support of a person in water. Lifebuoys carried by British ships must comply with regulations laid down by the Board of Trade, and are of standard or proprietary type. A standard lifebuoy is a ring of canvas,



Lifebuoy. Common type

with an outer diameter of 30 ins., and an inner of 18 ins., filled with solid cork and weighing not more than 13½ lb. It must float in fresh water at least 24 hours supporting 32 lb. of iron, and must be covered with canvas or other strong material. Certain proprietary lifebuoys are filled with either 3½ lb. of kapok or 8½ lb. of balsa wood instead of cork, while the covering may be copper sheeting or synthetic rubber. All lifebuoys must satisfy a uniform buoyancy test, and must be fitted with grab lines. Some lifebuoys on British ships are equipped with self-igniting buoyant lights inextinguishable in water. Every ship must carry at least one lifebuoy with 90 ft. of line. Lifebuoys are usually kept also at docks, harbours, and frequented watersides.

Life Class. Class or dept. of a school of art where the student is taught to draw or model the draped or undraped human figure.

Life Guards. Premier regiment of the British Army. Although not the oldest by right of seniority, it takes precedence over all other corps. Formed in 1660 as a bodyguard to Charles II, the regiment originated in two troops of Cavaliers who accompanied the king into exile. One was called the king's troop and



Life Guards badge

the other the duke of York's troop. At the Restoration, Monk's life guards were absorbed into the regiment as a third troop (the queen's), and at the union of

England and Scotland in 1707 a fourth troop was raised. In 1747 these four troops were reduced to two, but squadrons of horsed grenadiers were later added to the regiment. In 1788 each troop was brought up to regimental strength and the troops became the First and Second Life Guards respectively. In 1922 these two regiments were amalgamated. Together with the Royal Horse Guards (the Blues) the unit constitutes the Household Cavalry.

Rankers in the Life Guards were long described not as troopers but as private gentlemen, and at one time prospective recruits had to pay a premium to enlist. Another distinction enjoyed by the regiment is that it carries four standards. The Life Guards won their first battle honour at Dettingen in 1743 and covered the retreat at Fontenoy in 1765. Detachments served under Wellington in the Peninsula and made a memorable



Life Guards Corporal of horse

charge at Waterloo. In 1882 they were engaged at Tel-el-Kebir, and in the Boer War shared in the relief of Kimberley and the battle of Paardeberg. In the First Great War the Life Guards served first with the 4th cavalry brigade, but in 1916 they were dismounted and fought as infantry. The following honours were earned: Mons; Le Cateau; Marne, 1914; Aisne, 1914; Messines, 1914; Ypres, 1914, '15, '17; Somme, 1916, '18; Arras, 1917, '18; Hindenburg Line.

At the outbreak of the Second Great War, the Life Guards and Royal Horse Guards were amalgamated to form the 1st Household Cavalry regiment and went to Palestine with the 1st cavalry division. Shortly after its arrival the unit was mechanised, and served in Iraq, Syria, N. Africa, Italy, and Europe. In 1940 a second Household Cavalry regiment was formed as an armoured-car unit with the Guards armoured division in the liberation of Europe. In Oct. 1945 a squadron of Life Guards was again mounted on horseback for ceremonial duties in London and Windsor.

Life Saving Society, ROYAL. British society. Founded in 1891, it exists for the purpose of providing education in life saving and the resuscitation of the apparently drowned. It does this by promoting classes, lectures, competitions, etc. The head offices are 14, Devonshire Street, London, W.1, and there are branches in the U.K. and various parts of the British Empire. Princess Elizabeth is vice-president of the society.

Life's Handicap. A volume of twenty-seven short tales, stories of Mine Own People, by Rudyard Kipling, 1891. It contains some of his best early work in this form, including representative examples of his humour and tragedy.

Life-tenant OR TENANT FOR LIFE. In English law, a person who is entitled to the possession of land, with its rents and profits, for the period of his life. A life-tenant comes into existence when land is settled under a family settlement. Since the Law of Property Act, 1925, a life-tenant has the fee simple of the land vested in him which he holds in trust for the persons entitled after him under the settlement. See Land Laws.

Liffey. A river of Eire. It is formed by two streams which rise in the mountains of Wicklow not far from Enniskerry. Thence it flows in a semicircular course W. and N.E. through co. Kildare and past Kileullen and Newbridge, and across co. Dublin. Having passed through the city of Dublin, where there are nine bridges, it falls into Dublin Bay. Its length is 50 m.

Lifford. Co. town of Donegal, Eire. It stands on the Foyle, 15 m. S.S.W. of Londonderry, with which it is connected by rly. It faces Strabane in N. Ireland, on the other side of the Foyle. The chief buildings are those erected in the 18th century for county business, and an infirmary. Lifford became a town in the time of James I. Pop. 400.

Lifford, VISCOUNT. Irish title borne since 1781 by the family of Hewitt. It originated with Sir James Hewitt, lord chancellor of Ireland, who was made a baron in 1768 and a viscount in 1781. The 2nd viscount was dean of Armagh, and the title descended from him in the direct line to Evelyn, 7th viscount, who was born Dec. 18, 1880, and succeeded his father in 1925. The family's connexion with Ireland is now slight.

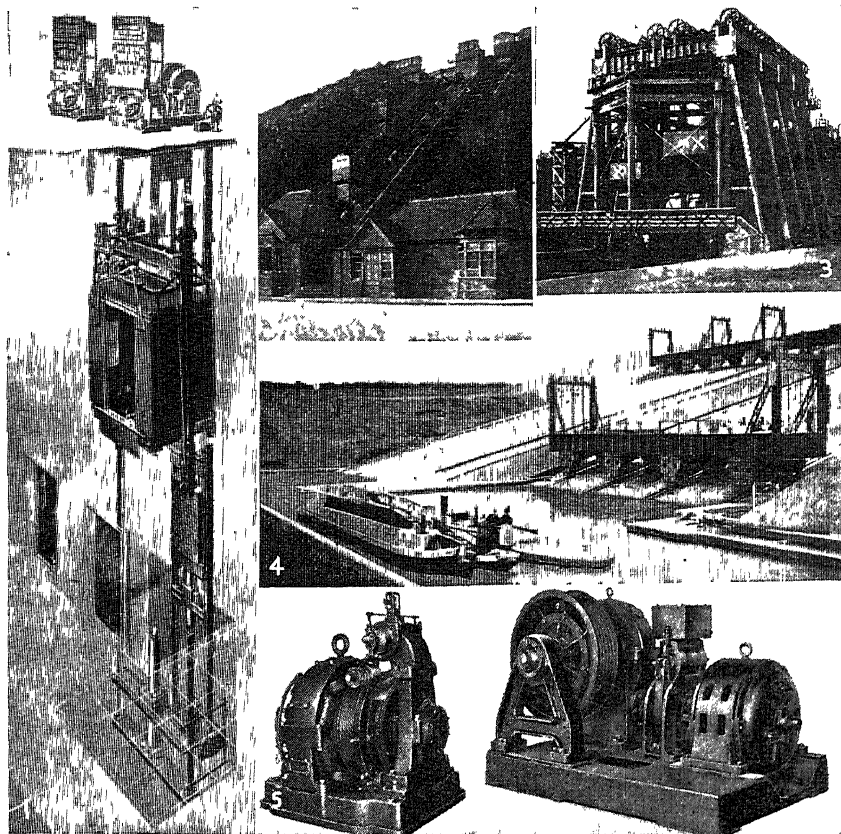
Lift. An appliance designed for the vertical transport of persons or materials by a guided car or plat-

form. It is recorded that one was built by Archimedes in 236 B.C., and archaeologists have discovered what are claimed to be ancient lift systems. About the middle of the 19th century hydraulic power was applied to lift design; the first electric lift (elevator) appears to have been installed in Baltimore, U.S.A., in 1887, and a similar one about the same time in London.

Starting with the crude hand lift, engineers improved the machines, making use of steam, hydraulic, and electric power. Hydraulic lifts, now rarely installed, though many remain in use, are constructed with the car or platform mounted on a ram which slides in a cylinder sunk in the ground directly below. Movement of the lift is controlled by a single valve arranged to admit to the cylinder water under pressure, thus raising the car or platform, and permit the weight of the car or platform to exhaust the water from the cylinder, thus lowering it. Travel is limited by the stroke of the ram and seldom exceeds the distance between two floors.

Electric lifts can travel to any height at speeds up to 1,200 ft. per min. The car is suspended at one end of the wire hoisting ropes which pass over the grooved driving sheave; at the other end of the ropes is a weight to counter-balance the weight of the car and part of the load. The power is transferred from the driving sheave to the ropes by friction; the shape of the grooves and number of ropes is such that no slip occurs. Speeds up to 350 ft. per min. demand geared driving machines, in which the power is transmitted to the sheave through worm reduction gearing. For speeds over 350 ft. per min. the machines are without intermediate gearing.

A safety device, operated by a centrifugal governor, is fitted beneath the car platform; it grips the car guides in a descent at excessive speed. Below 200 ft. per min. the safety gear will grip the guides instantaneously, but at higher speeds the car is brought gradually to rest. Other devices ensure that the lift cannot move unless the gates or doors are closed, and that the power supply is interrupted if the car travels beyond the terminal landings. The movement of the lift is controlled either by a switch in the car which is moved to the up or down position and centred as the required floor is reached, or by a set of push buttons in the car and on the



Lift. 1. Fully automatic passenger lift with controller and driving machine above. 2. Cable lift at Folkestone. 3. Anderton hydraulic lift on the Weaver, Cheshire. The troughs in which boats are carried, marked X, are raised and lowered by hydraulic rams. 4. Barge lifts on inclined plane, Grand Union Canal, Foxton. Barges are floated on to submerged trough, which ascends the incline, being partly balanced by descending trough. 5. Gearless traction driving machine.

By courtesy of 1, 5 and 6, Waygood-Otis, Ltd.; 3, River Weaver Navigation

landings, numbered to correspond with the floors served. All lifts operating about 150 ft. per min. decelerate on approaching the selected landing.

Fully automatic lifts are equipped with electrically operated doors which close when a button is pressed and open as the car is levelling to a landing. Operating devices are up and down buttons on the landings and a full set of buttons in the car numbered to correspond with the floor served. The lift controller registers all calls made for the lift, and the car automatically stops for all up calls during upward travel, and all down calls during downward travel. Several lifts can be arranged to operate together; the first car passing a landing in the desired direction of travel automatically collects passengers, and the lift cars reverse their direction of travel at the highest call made. Power supply may be either D.C.

or A.C. Highspeed lifts draw their supply from individual continuously running motor generator sets, the motors of which are connected to the supply system. The output of the generator increases from zero to full voltage when the lift is started, thus ensuring smooth and rapid acceleration of the lift car. Lifts described here are installed in flats, offices, and stores; but special equipment (see illus.) is designed for particular purposes, e.g. ascending and descending cliff faces or mine-shafts. The Factories Act, 1937, contains provisions relating to the construction, maintenance, inspection, and operation of lifts.

Lift. In aeronautics, the component at right angles to the direction of airflow, resulting from the forces acting on a lifting surface (e.g. an aerofoil) in motion through the air. In straight and level flight, lift is exerted in a vertical, upward direction.

Lift Bridge.

Bridge over a river or stretch of water, part of whose deck or roadway can be raised vertically to permit the passage of ships beneath. One of the largest lift bridges in the U.K. links Middlesbrough with Co. Durham across the Tees. The movable span of 270 ft. is suspended at both ends by steel cables running through pulleys on vertical towers 170 ft. high; the lifting section weighs 5,400 tons and is balanced by counter-weights, the actual lifting being done by electricity. It can be raised in 1½ mins. A lift bridge at Chicago has a movable span 130 ft. long and 50 ft. wide, and is raised vertically to 155 ft. by electric power. See illus. p. 1423.

Ligaments

(Lat. *ligare*, to bind). Medical term for a band of tough fibrous tissue which binds organs or bones together.

Ligao. Town of Luzon, Philippine Is. Mayón to the E., is an active volcano. Rice, abaca, and coconuts are grown. Pop. 21,000.

Ligature (Lat. *ligatura*, band). Thread of catgut, silk, or other material employed for tying round blood-vessels. Ligatures are used not only to stop haemorrhage but also to lessen the flow of blood, e.g. to an aneurism. They are extensively employed in surgical operations, and their use was known in Roman times. Catgut is the material generally used for internal ligatures, on account of its quick absorption, and silk when greater strength or slower absorption is wanted. The latter has the advantage of being sterilised more easily than catgut. See Surgery.

Ligature. In music, a passage of more than one note sung to one syllable. This is also the name given to the metal band by which the reed is attached to the mouth-piece of certain reed instruments.

LIGHT: ITS NATURE AND EFFECTS

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This general article describes the chief theories of light as distinct from its practical measurement and applications. It serves to introduce such subjects as Colour; Diffraction; Dispersion; Lens; Optics; Polarisation; Refraction; Spectrum. See also Laghting; Relativity, and biographies of Huygens; Newton, etc.

For many centuries investigators have held the view that any luminous body is the source of some influence which, acting on the eye, excites the sense of sight.

Pythagoras appears to have been the first to maintain what is now known as the corpuscular theory, viz. that vision was caused by material particles projected from the surfaces of objects into the pupil of the eye. Aristotle advanced the view that light was an action of a medium which he called the pellucid, anticipating in a vague way the doctrine of the ether and the undulation theory of light.

Slowly information as to the actual behaviour of light when passing from one transparent medium to another was gathered. The reflection of light, its refraction and dispersion by lenses and prisms were studied; the telescope and microscope were invented; and in the 17th century Newton was able to marshal a formidable array of facts in support of the emission or corpuscular theory.

Newton's Explanation of Refraction

The rectilinear propagation of light received a very simple explanation, since material particles would move in a straight line unless acted on by a force. Such a force might arise at the surface separating two media; for when a particle arrived within a minute distance of this surface, it would experience a pull into one medium in a direction at right angles to the surface which would differ in magnitude from the pull exerted by the second medium, so that if the component of its velocity at right angles (or normal) to the surface were thereby altered, while its component parallel to the surface were not, the path would be suddenly swerved into another direction, and this swerving is just what is observed when reflection or refraction of light takes place.

If the pull backward of the medium the particle is tending to leave were sufficiently great as compared with the pull forward of the other medium, the particle would actually turn back into the former medium along the reflected ray; if not so great, it would penetrate the second medium along a re-

fracted ray, making a larger angle than before with the normal line to the surface, and move with a somewhat reduced speed. If, however, the pull forward were greater than the pull backward it would again be refracted, but with the angle between the refracted path and the normal less than before, the speed being increased.

One difficulty of this theory was to account for the fact that a surface may both reflect and refract, so that, for instance, light falling on glass is partly reflected and partly transmitted. To meet it Newton was led to endow the luminous corpuscles with periodic phases of easy reflection and easy transmission, so that on reaching the surface some are in a condition to be reflected and some to be transmitted. He elaborated an hypothesis as to the manner in which these phases were produced, a portion of his full theory which suffered modification at the hands of some later exponents of it, such as Bosovich and Biot. But the most important result of Newton's theory was the fact that he not only gave a plausible qualitative explanation of rectilinear propagation, reflection, and refraction, but he was able to use it quantitatively, and to prove by mathematical analysis the truth of the laws of reflection and refraction which had been discovered experimentally.

Emission Theory Disproved

One conclusion of his theory, however, proved ultimately to be its absolute undoing. It will be seen that, in his view, if light is bent nearer to the normal in going into one medium from another, it must travel faster in the former medium than in the latter, e.g. it should have a larger speed in water or glass than in air. We return to this point below.

It is known that light travels with a finite speed, taking, for instance, about eight mins. to come from the sun. The question naturally arises, where is this energy located in the meantime? On the emission theory it is the kinetic energy of the flying corpuscles. But there is another way of transmitting energy. When a train of waves is excited in water, it is not matter which is propagated, but

an oscillatory state of motion, and by this means movement can be imparted to a body from a distant oscillating source. Similarly, the transmission of sound through air or water or the ground involves no forward movement of matter as a whole, but the transmission through it of a certain condition in which each layer of the matter goes through periodic states of compression and extension, or of condensation and rarefaction. Now, we have seen that Aristotle held some vague notion that light might be something of this nature in the "pellucid," and the great philosopher Descartes propounded the view that vision was excited by a pressure transmitted instantaneously through an elastic medium filling all space; but the real founder of the modern wave theory of light was Christian Huygens.

Wave Theory of Huygens

He postulated the existence of a luminiferous ether filling all space, and held that vision is due to the excitation of waves or ripples in this medium by luminous matter, these ripples being transmitted through the ether with a definite speed. In transparent matter the ether exists in a modified condition, so that the speed of the ripples through it, so modified, is different from that through the ether in free space. By the aid of this hypothesis he was able to account for the laws of reflection and refraction of light quite as satisfactorily as Newton.

The swerving of waves from their direction can be easily observed in water on any shore where, by reason of shallowing, the speed of the waves is gradually reduced. Huygens was able to deduce the laws of refraction quite easily by his assumption of difference of speed in different media, but reached the conclusion diametrically opposite to that of Newton viz. that in water and glass light should travel more slowly than in air. Where Huygens's theory failed, as it left his hands, was in accounting for rectilinear propagation; for, while an obstacle could stop flying corpuscles and thus produce a shadow behind, it was difficult to see how it could prevent waves from spreading into the ether behind it, since it is a commonplace observation that a rock does not produce a dead calm behind it when waves are falling on it, and, further, that sound can be heard round a corner.

This failure caused Huygens's views to fall into disrepute. They were revived, however, by an English scientist named Young about

1800). As a matter of fact, it is possible for light to bend round corners, as can be demonstrated under special conditions; and an obstacle does produce stillness behind it, provided the wavelength is very small compared with the size of the obstacle—e.g. quite a small rock will prevent short ripples from spreading behind it.

Experiment on Wave Hypothesis

Young performed an experiment which was a problem for the supporters of the emission theory, while his explanation of the wave hypothesis was simplicity itself. He caused two narrow beams of light to stream through two small holes in a screen; they were very nearly parallel to each other, but not quite, so that somewhere they crossed each other's track, going almost in the same direction. Where they crossed, Young was able, by suitable adjustments, to show interference at certain points, i.e. production of darkness. Now, it is impossible to admit that one stream of corpuscles crossing another stream almost in the same direction can produce a complete stoppage of the two streams anywhere; but if one train of waves crosses another having the same wavelength and amplitude of motion, it is very easy to see that where a crest in one system coincides with a trough in the other there will be no oscillation at all.

Young's advocacy of the wave theory was taken up by Fresnel, Kirchhoff, Stokes, Thomson, and Rayleigh, who gradually elaborated the hypothesis until it gave a satisfactory account of all the well-known properties of light. The death-blow to the corpuscular theory was given by a French physicist, Foucault, who in 1850 succeeded in measuring the time required by light to travel the length of a large room, and demonstrated that it was longer if the light had to travel through water instead of air, a fact absolutely irreconcilable with Newton's views.

Maxwell predicted, and Hertz obtained experimental evidence of, electro-magnetic waves and showed their fundamental identity with light. The ether is regarded as the conceptual mechanism to illustrate certain results, and no attempt is now made to visualise the nature of the ether in terms of that of material bodies. Maxwell assumed that the displacements constituting the trains of waves are similar to alternating currents and their associated magnetic fields. The electric and magnetic vectors are mutually at right angles to one

another and to the direction of propagation of the wave. The plane of polarisation of a light wave is usually defined with respect to the direction of the electric vector.

When electro-magnetic radiation impinges on matter, absorption and/or emission may take place, but the energy transfer involved can occur only in small discrete packets called quanta. According to the quantum theory the energy $E = h\nu$, where ν is the frequency of the radiation and h is Planck's constant (6.62×10^{-27} erg sec.). A single light quantum is known as a photon; this idea of quanta is illustrative of the particle character of the radiation as opposed to its wave nature. The extent to which light waves are reflected, transmitted, or absorbed by a material upon which they impinge, is dependent upon the manner of the interaction of the electro-magnetic waves with the electrical charges of the atomic or molecular structure of the material. If the frequency of the incident radiation coincides with a natural frequency of the molecular or atomic structure of the substance, then only a shallow penetration will take place and re-radiation will result as with a low pressure vapour. Under high pressures the surface of the vapour may behave as a selective reflector for light of a particular wavelength. It may also be noted here that by forming on glass a thin layer of a transparent material, such as cryolite, it is possible to obtain almost complete transmission for light travelling in a normal direction from air to glass.

The Photoelectric Effect

Metals possess marked electrical conductivity and consequently exhibit a characteristic optical behaviour. As a first approximation a metal may be regarded as an assembly of electrons within a crystal lattice of positive ions, and if the incident radiation is of sufficiently short wavelength, electrons may gain enough energy from the radiation to leave the metal surface; this phenomenon is known as the photo-electric effect.

If a medium is not optically homogeneous, a certain amount of scattered light is observed in directions other than that of the refracted ray. The effect is most enhanced in media which contain particles of size less than the wavelength of the incident light. This scattering has been shown by Rayleigh to be inversely proportional to the fourth power of the wavelength, and so will be greater

for the blue end of the spectrum; which offers an explanation of the blue colour of the sky. The depth of colour of pigments under white light may be controlled to a certain extent by the fineness of the grinding of the pigment.

Some solids re-emit light after being illuminated, but the effect is generally quite feeble and of short duration. One class of substance shows this phenomenon in the pure state, while another depends upon the presence of certain impurities. On exposing a system to visible radiation certain chemical changes may be promoted which are consequently known as photo-chemical reactions. These are generally very complex in character owing to the secondary thermal reactions which follow the primary effect produced by the light, but on gaseous systems it is usually possible to deduce the nature of the molecular changes taking place by examining the type of spectrum obtained. An important aspect of this problem known as photosynthesis in plants deals with the conversion of solar energy into the potential energy of the substances built up in the process of growth.

Consult Fundamentals of Physical Optics, F. A. Jenkins and H. E. White, 1937; Perception of Light, W. D. Wright, 1937; Chemical Aspects of Light, E. J. Bowen, 1946; Application of Interferometry, W. E. Williams, new ed. 1947.

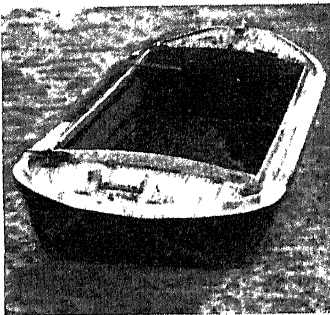
Light. A British periodical. Founded by Stainton Moses in 1881, as a journal devoted to spiritualism and psychical research, it is the official organ of the London Spiritualistic Alliance. The editorial offices are at 16, Queensberry Place, London, S.W.7.

Light Brigade. Name given to a brigade of cavalry when its regiments are divided into light and heavy. It is applied specifically to the brigade consisting of the 4th and 13th Light Dragoons, the 8th and 11th Hussars, and the 17th Lancers, that made the famous charge at Balaclava under the earl of Cardigan. *See Balaclava; Crimean War.*

Light Coastal Forces. Flotillas of motor torpedo boats and motor gunboats maintained by the Royal Navy during the Second Great War to combat the activities of German E-boats and to attack enemy convoys in the English Channel. Ships of light coastal forces, nearly all manned by the R.N.V.R., participated in many combined operations on the European coast, including the raid on Dieppe. *See Coastal Craft.*

Light Cruiser. A fast, lightly armed, thinly armoured warship. First developed for the Royal Navy as fleet auxiliaries and screens for the battle squadrons, large numbers were built during the First Great War for service in the North Sea. They displaced from 3,500 to 5,000 tons and were armed with four to eight 6-in. guns. They have been generally replaced by 10,000-ton cruisers, while many of their original scouting and screening duties are now carried out by destroyers. Most light cruisers of the Royal Navy were converted at the beginning of the Second Great War into A.A. ships. See Cruiser.

Lighter. A large flat-bottomed boat used in ports for loading and discharging vessels and for carry-



Lighter. One of the flat-bottomed boats used for coal and cargo on the Thames

ing cargo over short distances. It is sometimes fitted for steam or motor propulsion, but more usually is towed from one point to another. Special lighters are used for the bulk carriage of oil and petrol. The men employed on them are called lightermen, and on the Thames are licensed by the Watermen's and Lightermen's Company. Lighters were used by the British at the landing on Gallipoli in April, 1915, and during the Second Great War made anchorages for barrage balloons protecting ports and estuaries.

Lighter. Mechanical device for producing a spark which induces a flame. It is commonly used for igniting a gas jet or making a flame to light a cigarette or pipe. The earliest mechanical lighter, as distinct from a flint and steel, was the strike-a-light of the early 19th century. It consisted of a brass box fitted with a flint lock similar to that of a musket. When the trigger was pressed, the flint struck a piece of steel fixed on the top of the box and the spark, cutting across the head of a sulphur match, set it alight.

Welsbach discovered (mid 19th cent.) that cerium and iron fused together resulted in a hard substance which emitted a brilliant spark upon being struck with a steel. In the First Great War this so-called flint was incorporated in a simple form of cigarette lighter; braided tow was enclosed in a small metal cylinder with a fine-toothed wheel and a flint on top. Friction between flint and wheel produced a spark which fell on the tow and caused it to smoulder; blowing on the tow created a red glow sufficient to light a cigarette. From this developed the modern cigarette lighter, a metal container with wadding saturated in spirit and surrounding a wick. The end of the wick protrudes through the case in proximity to the flint and wheel; when the latter is struck a spark falls on the wick to induce a flame.

The first lighter in which the wick-cover is raised and the wheel revolved over the flint in one action was introduced by the American Ronson. By fitting a perforated cover round the wick it is possible to produce a flame which does not blow out in the wind. Another type of lighter does not require petrol or wick, but when opened the action of the air on a chemical capsule induces a glow. Gas lighters either are of the flint and steel type, or have a dry electric cell which, when a button is pressed to close a circuit, passes a small current through a thin wire, inducing sufficient glow to ignite a gas jet. Another type of dry cell gas lighter is connected to the gas supply.

Lightfoot, JOHN (1602-75). An English scholar and divine. He was born at Stoke-upon-Trent, on March 29, 1602. Educated at Christ's College, Cambridge, he became a schoolmaster and a clergyman. In 1643 he was made master of Catharine Hall, Cambridge, and in 1654 became vice-chancellor of the university. He was still rector of Much Munden, Herts, and master of Catharine Hall, when he died at Ely, Dec. 6, 1675. Lightfoot was an influential member of the Westminster Assembly and wrote a *Journal of its proceedings*. He was famous for his Hebrew scholarship.

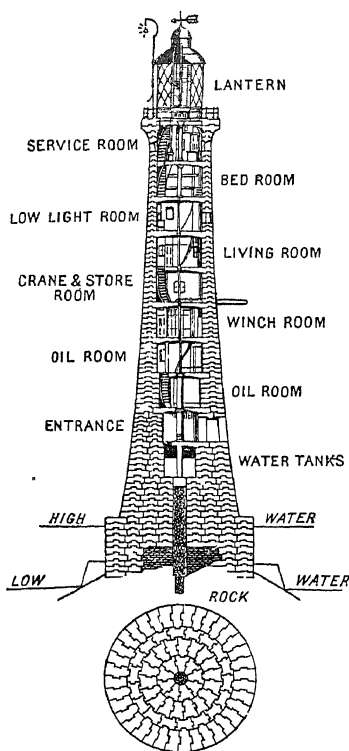
Lightfoot, JOSEPH BARBER (1828-89). British theologian and prelate. Born at Liverpool, April 13, 1828, he was educated at King Edward's School, Birmingham, and Trinity College, Cambridge. He was senior classic in

1851, then fellow and tutor of Trinity. In 1861 he was made the Hulsean professor of divinity; and in 1871, canon residentiary of S. Paul's; in 1875, Lady Margaret professor of divinity. In 1879 he was chosen bishop of Durham. He died at Bournemouth, Dec. 21, 1889. Regarded as one of the greatest theologians of the 19th century, he took as his special field the New Testament, and he was rather a defender than an attacker. Lightfoot worked on the committee for the revision of the N.T., and defended its canons in articles in *The Contemporary Review*. *Consult* Lightfoot of Durham, ed. G. R. Eden and F. C. Macdonald, 1932.

Lighthouse. Building erected on or near a coast or on a rock at sea, and provided with a light visible at a distance to warn mariners of danger and assist them in fixing their position. From earliest days of deep sea navigation, towers were erected with beacon fires to warn seamen of dangerous rocks and shoals, those built by the Libyans and Cushites in Lower Egypt in the 7th century B.C. being notable. The first lighthouse regularly maintained for the benefit of seafarers was the Pharos of Alexandria, built in the reign of Ptolemy II (283-247 B.C.). It was one of the seven wonders of the world, and its name was long a generic term for lighthouse.

In A.D. 50 the emperor Claudius built a beacon tower at Ostia; other noted lighthouses were maintained by the Romans at Messina and Ravenna. Permanent lighthouses were set up by the Romans at Dover, Boulogne, Holywell, and Flamborough Head. The earliest to consist of a tower exposed to the sea on all sides was erected at the mouth of the Gironde in 800. With the development of seaborne trade came towers with braziers, amongst them those at Tynemouth (1608), St. Bees (1718), and the Lizard (1751). The first American lighthouse was on Little Brewster Island, Mass., 1716.

Lighthouses are divided into two categories, either built on rocks or other sites exposed to the sea, or placed on the shore. Exposed lighthouses vary in structure according to peculiarities of site and foundations. In masonry the general principle is that used by Smeaton for Eddystone (*q.v.*) in 1759. Points to be observed in constructing the tower are that the foundations should be as deep and the centre of gravity as low as possible; the structure should be



Lighthouse. Sectional elevation and plan of base of Eddystone lighthouse

circular, its lower portion presenting a vertical face to the beating of the sea; the upper sections should be either straight with a uniform batter, or continually curved in the vertical plane. Some exposed lighthouses are of reinforced concrete.

For marking shoals or reefs where the bottom is sandy or insecure, steel piles are driven in and a lattice framework of steel erected thereon to carry the light and the keeper's accommodation. For a substantial lighthouse on sandbanks or shoals, cylinder or caisson foundations are used. The Rother-sand lighthouse off the mouth of the Weser, and the Fourteen Foot Bank light in Delaware Bay were built on this principle. Where a lighthouse has to be erected on a rock permanently covered with water, the site is enclosed by a coffer dam and then pumped dry; the foundations are then laid; e.g. Spectacle Reef light between Lakes Michigan and Huron.

ILLUMINATION. The lighthouse beams are produced by gathering the rays from the source of light by lenses and prisms which are arranged as annular panels or panel segments in a frame, or as

a cylinder surrounding the light source. Large glass mirrors may also be used. Three different systems of light projection are employed: (1) catoptric, which was invented in 1760 and reflects the rays of light only from the faces of incidence, usually silvered mirrors of plane, spherical, or parabolic profile; (2) dioptric, invented in 1786, passing the rays through optical glass, refracting them at the incident and emergent faces; (3) catadioptric, introduced 1823, a combination of the others.

Wood or coal was the principal illuminant until Smeaton introduced candles on Eddystone. Oil lamps with flat wicks appeared in 1763, and the invention of the Argand burner in 1780 greatly improved illumination. Early in the 19th century came sperm and colza oil; and in 1837 coal gas. Burners to consume petroleum were introduced in 1868. Modern lighthouses on isolated sites commonly use petroleum vaporised by heat, mixed with air, and burnt in an incandescent mantle. In automatic lighthouses compressed acetylene gas is often used.

Electric light was first adopted as a lighthouse illuminant in 1858 and is now extensively used. Arc lamps have been superseded by high-power, gas-filled, electric-filament lamps. Where no outside power is available, a generating set driven by an internal combustion engine is installed. Storage batteries or emergency gasburners are available. Some lighthouses have four tiers of lamps and lenses. Whether the lamp and lenses are single or multiple, the apparatus is turned by clockwork, and may float in a bath of mercury to reduce friction.

When the rays from the source of light are thrown equally in a belt round the horizon and condensed only in a vertical plane, this is a fixed light. To assist in identification of the lighthouse, the beam is cut off at specified intervals, either by a screen revolving round the lamp or by a cylinder lowered over it. When the beam is concentrated into a pencil or cone of light directed towards the horizon and made to revolve round the source of light, this is a flashing light.

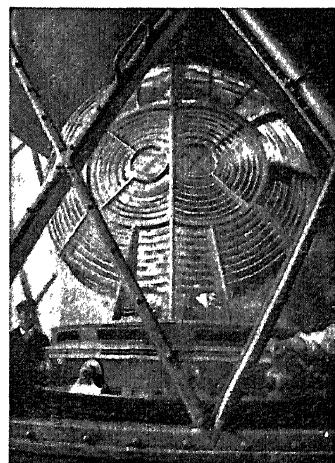
The following are particulars of famous lighthouses of the British Isles. Heights are reckoned from highwater level to the bottom of the lantern, except where the letters f.p. indicate the focal plane of the lantern. Designer and date of completion are in brackets:

Bell Rock, off Fife, 100 ft. (R. Stevenson, 1806); Skerryvore, off Tiree, Hebrides, 141 ft. (A. Stevenson, 1843); Wolf Rock, between Lizard and Scilly Is., 104 ft. (J. Walker, 1862); Dhu Heartach, S.W. of Mull, W. Scotland, 126 ft. (D. and T. Stevenson, 1873); Chicken Rock, S. of Isle of Man, 116 ft. (D. and T. Stevenson, 1874); Eddystone, 14 m. S.W. of Plymouth, 131 ft. to f.p. (J. N. Douglass, 1883); Bishop Rock, W. of Scilly Is., 146 ft. to f.p. (J. N. Douglass, 1888); Beachy Head, 103 ft. to f.p. (T. Matthews, 1902); Fastnet, off Cape Clear, Cork, 160 ft. to f.p. (1903).

Lighthouses, buoys, and beacons throughout England, Wales, the Channel Is., and Gibraltar (apart from a small number controlled by local lighthouse authorities) are managed and superintended by Trinity House. Those in Scotland and the Isle of Man are managed and superintended by the commissioners of northern lighthouses.

The first lighthouse for aircraft was erected at Biggin Hill in 1920, to assist pilots on the London-Paris route. With the development of air transport, lighthouses have covered regular air routes throughout the world. They consist of either a white rotating beacon, coded to flash a single-letter character, or a red neon beacon which flashes in Morse a two-letter identification.

Bibliography. Lighthouse Construction and Illumination, T. Stevenson, 1881; Ancient and Modern Lighthouses, D. P. Heap, 1889; The Live Work of Sir J. Chance, J. F. Chance, 1902; British Lighthouses; J. S. Wryde, 1913; Silent Sentinels, R. L. Jones, 1944.



Lighthouse lantern showing system of reflecting prisms for flashing lights, on principles designed by Hopkinson in 1874

LIGHTING, ARTIFICIAL

A. D. S. Atkinson, A.M.I.E.E., and R. N. Le Fevre, M.I.Gas.E.

Methods of artificial lighting, ancient and modern, are here described. Both domestic and public aspects of the subject are treated, with particular emphasis on electricity and gas as sources of light. See also Electric Power; Gas for Light, Heat, and Power; Heating; Illumination; Light, etc.

Light is a form of energy, consisting of electromagnetic waves similar to radio waves in that they travel in space at the same speed of 3×10^{10} cms. (186,000 m.) per sec. The wavelength of light waves, however, is so short as to be measured in ten millionths of a mm., or Angström units (Å).

Sir Isaac Newton demonstrated that "white light," or daylight, can be divided into the colours of the visible spectrum, i.e. violet, indigo, blue, green, yellow, orange, and red, corresponding to wavelengths of approx. 4,000 Å to 7,000 Å. The human eye is not sensitive to radiations having wavelengths outside this range which, however, forms only a small fraction of the total electromagnetic spectrum. Wavelengths longer than 7,000 Å produce heat and the region used for radio communications, while those shorter than 4,000 Å produce, among others, ultra-violet rays, X-rays, and cosmic rays. Ultra-violet rays are important today, for this form of energy can be converted into visible light—the light of fluorescent lamps is derived from it.

Animal Fats as Source of Light

Having made a fire to warm his gloomy cave dwelling, primitive man realized that it produced light as well as heat, and it was a natural step to the first torchlight, or burning brand plucked from the fire. A little later, the discovery that animal fat would burn and give a better light produced the earliest form of crude oil lamp of which there is any existing record—a hollowed-out stone to hold the fat with a wick of vegetable fibre laid on the edge. A lamp of this pattern, found in France in 1928, is believed to be 80,000 years old. The simple idea of an oil-fed wick burning freely in air remained the basic lamp construction until in 1784, Argand, a Frenchman, invented the prototype of the modern oil lamp having a glass chimney and tubular wick to which air had access both inside and outside.

Rush-lights, which were simply rush stems dipped into hot fat, were the earliest candles. The Bible refers to the famous Hebrew seven-branched candlestick, while the Phoenicians had wax candles; and during the 2nd cent. A.D.

tallow candles were in use. The Guild of Wax and Raw Tallow Chandlers prepared specifications for the length and size of candles in the 14th and 15th cent. These candles were fixed on spikes. Socket candles first appeared in the 16th cent.

From 1640 experiments had been made with combustible gases from coal. In 1787 Lord Dundonald tried experiments at home on gaslight. William Murdoch was a pioneer in this field—in 1798 he installed the first practical gas lighting system in a factory. Street lighting by gas was introduced into London in 1807. By the end of the 19th cent. the crude gas burner had given place to the incandescent mantle invented by von Welsbach in 1878. The greatly improved light so obtained resulted in widespread popularity for gas lighting.

Early experiments in the production of light by electrical means were made as far back as 1740, but the electric lamp did not appear until 1800 when Sir Humphrey Davy demonstrated the first carbon arc lamp. Practical lamps of this type became increasingly used following the development of large-scale electric generation in 1849. Experiments with incandescent lamps having carbon filaments date from 1859. Then in 1878 Sir Joseph Swan demonstrated his carbon filament glow lamp at Newcastle-on-Tyne. Thomas Edison in the U.S.A., working on similar lines, obtained a patent for his carbon lamp in 1879; and by 1905 carbon lamps had reached almost the limit of development. Tungsten filament lamps, introduced in 1906, were greatly improved in 1909. By 1913 gas-filled tungsten filament lamps were being manufactured, followed by the "pearl" lamp in 1924 and the coiled-coil lamp in 1934.

First Commercial Use of Electricity

Though electric discharge lamps derive from the systematic experiments of Michael Faraday in 1838, Moore did not begin his researches into their value as illuminants until 1893. The first commercial installation of these lamps was at New Jersey, U.S.A., in 1904; a few years later they were installed at the Savoy hotel, Lon-

don. The early lamps, mainly of the mercury vapour type, were developed by Way in England, Arons in Germany, Cooper Hewitt in the U.S.A. Neon and sodium discharge lamps followed. Some improvement in the colour of mercury light was achieved by Wolke in 1912, who produced a discharge lamp containing mercury and cadmium.

In 1928 hot cathode discharge lamps, which could be operated direct from normal mains voltages, were introduced. Commercial development was rapid, and by 1933 mercury and sodium electric discharge lamps were installed for street lighting in England.

The fluorescent lamp, manufactured commercially in Great Britain since 1939, consists of a low pressure mercury discharge lamp in tubular form. The inside of the glass tube is coated with fluorescent powder which emits visible light by excitation from the ultra-violet radiation of the mercury discharge. Such lamps give high electrical efficiency (see diag. in Lamp, Electric), and a light closely approximating to daylight in quality, an achievement constantly sought during the centuries.

PRINCIPLES OF LIGHTING.

Lighting should not only provide brightness on the object or area under view, sufficient for it to be seen; it should also come from the right direction, so that the eye is not discomforted or disabled. We automatically do this with day lighting, whether outdoors or in, by turning away from the sun, shading our eyes, or, indoors, by working at a table with a window on our left.

Accurate control of daylight indoors is not possible; slatted "Venetian" blinds (or "louvre" if the slats are vertical) reduce the brightness of windows in the line of sight without greatly reducing the quantity of light passing through them. Only a small percentage of the illumination outdoors is found in interiors, and this percentage is termed daylight factor (D.F.). Daylight is so variable that this is the only way of specifying the performance of a window; an average room will have a D.F. of the order of 20 p.c. immediately inside the window, falling to below 1 p.c. at the far side. Unobstructed morning daylight illumination may be between 100 and 1,000 lumens per sq. ft.; thus the illumination at the far side of the room will not usually exceed 1 to 10 lumens per sq. ft. (Use of the synonymous term foot

candle, for lumen per sq. ft., is deprecated by some authorities as being less descriptive of the

TABLE OF CONVERSION FACTORS FOR ILLUMINATION UNITS

	Lumen ft. ² or Foot candles	Lux
One Lumen ft. ² (f.c.) equals	1	10.76
One Lux equals	0.093	1

quantity—illumination—to which it refers.) Daylight alone is therefore often quite inadequate for any but the simplest visual tasks indoors.

A standard code of illumination values has been published by the Illuminating Engineering Society (e.g. 3 lumens per sq. ft. for corridors, 300 lumens per sq. ft. for operating tables) as a result of investigation based mainly on the size of the object in view and the contrast with its background (e.g. coal picking, large size but poor contrast, needs 20 lumens per sq. ft., which is also recommended for proof-reading, small size but good contrast).

Calculations of the lighting required for a particular purpose are usually carried out by the lumen method. A room index is found, depending on room proportions and mounting heights, and this is used in evaluating a coefficient of utilisation (i.e. the luminous efficiency of the installation as a whole), which is dependent also on the colour of room decorations and on the style and efficiency of fitting used. A factor must also be included to allow for normal depreciation due to dust and dirt, which is usually assumed to reduce initial efficiency by 20 p.c.

Though it is relatively easy to provide the required amount of light for good vision, it is frequently difficult to avoid undue brightness and glare. Bare lamps of any sort should not normally be used in interiors. Suitable placing of lamps can often obviate

bright reflections, and shadows can also be avoided or minimised by choice of an appropriate type of fitting and careful layout of the system. The fittings for interior illumination fall into three categories—mainly direct, general diffusing, and mainly indirect. Direct lighting gives harder shadows but higher efficiency and greater control of light than indirect; with indirect lighting, shadows can be almost eliminated.

Care must be taken that a mainly indirect system does not cause glare from the high brightness of the ceiling which may be necessary where high illumination levels are aimed at. Interior decorations will influence the

TABLE OF CONVERSION FACTORS FOR BRIGHTNESS UNITS

	Candle /in. ²	Candle /cm. ²	Candle /ft. ²	Lam- berts	Equiv. F.C.
One Candle : per sq. in. equals	1	0.155	144	0.4869	452.4
per sq. ft. equals	0.006944	0.001076	1	0.003382	3.142
per sq. cm. equals	6.452	1	929	3.142	2919
One Lambert (apparent lumens per sq. cm.) equals	2.054	0.3183	295.7	1	929
One Equiv- alent Foot Candle or Foot Lam- bert (one apparent lumen per sq. ft.) equals	0.00221	0.0003426	0.3183	0.001076	1

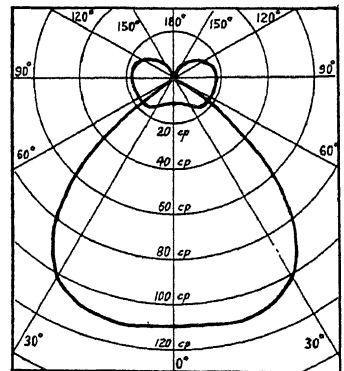
degree of illumination received as well as its colour. Light pastel shades have high reflection factors (e.g. pale cream 76 p.c., primrose 76 p.c., portland stone 62 p.c.); darker colours have low reflection factors (e.g. turquoise blue 15 p.c., post office red 17 p.c.). The light from a fitting is inter-reflected between ceiling and walls, and the darker the surfaces the more light will be absorbed, leaving less to illuminate the work. "Warm" colours (e.g. creams, light buffs, pale pink) can add a cheerful appearance to a room while "cold" colours (e.g. blues) chill.

In point by point calculations of illumination intensities, the output in a particular direction from the lamp and fitting is required: this is obtained from the polar curve, an example of which is shown in Fig. 1. But the size of the polar curve is not a measure of the lamp output. It

gives an accurate indication of intensity of light in a particular direction, which can be used in calculation; but the output in a particular zone must be found by applying a zone factor. The two curves shown are of lamps with the same lumen output. Polar curves are of great value in street lighting calculations.

ACETYLENE LAMPS. These used to be popular for bicycle head-lamps, but have been superseded by battery or generator-operated sets. Large acetylene lamps are still used for lighting roadworks, etc., at night when electric power is not available. The lamp consists of a container filled with calcium carbide, a water chamber, and a burner fitted with a reflector. The water dripping on to the calcium carbide at a steady rate produces acetylene gas. Gas is liberated more quickly than it is consumed so that a small pressure is built up; thus the acetylene passes to the burner under pressure. It burns with an intense white light which, being almost a point source, is glaring.

OIL LAMPS. These are of three types—direct flame, mantle, and pressure. In the first, a flat wick passes through a burner which is a rectangular slot surrounded by air holes; above the wick is a glass chimney which helps to create an upward flow of air. The wick, dipping into a chamber containing paraffin, absorbs the paraffin, which is transferred by capillary action to the top of the wick. When the lamp is lit the convection currents inside the chimney produce an upward flow of air (i.e. a draught), and draw air through the air holes near the burner, thus supplying oxygen to the flame. The carbon deposited must be removed periodically from the end of the wick to prevent smoke.



Lighting. Fig. 1. Two examples of polar curves for calculating illumination intensities.

In general construction, mantle-type lamps are like flame lamps except that a circular wick surrounds a gauze tube, and over the wick is placed a mantle. When the lamp is lit it starts off as a flame-type, but the heat generated at the tip of the wick causes air to be sucked up through the gauze tube, which tends to vaporise the paraffin; as it burns, the vaporised paraffin heats the mantle to incandescence, generating enough heat to keep the mantle glowing.

In pressure lamps, pressure is created by a pump in the side of the fuel chamber which forces liquid paraffin or petrol into a vaporising tube heated by externally applied heat, generally from a small trough containing methylated spirit. The vaporised fuel passes to the mantle under pressure, where it heats the mantle to incandescence. Enough heat is generated to vaporise the fuel in the vaporising tube without further application of external heat, and the sequence continues automatically.

A. D. S. Atkinson

GAS. Domestic gas lighting burners are now invariably of the inverted type in which the mantles are suspended beneath the burner. They may be pendant from the ceiling, or attached to the wall by a bracket. The actual burner is a bunsen tube giving an aerated flame to fit the mantle (*g.v.*), luminous because made incandescent by the heat of the gas flame. The luminous output of the mantle is proportional to the twelfth power of its absolute temp., and thus a small increase in temp. has a considerable effect on the increase in luminous output. The illuminating value of the naked gas flame, which was at one time the criterion of gas quality, is now of no consequence in determining the output of light; it is the heating power of the gas which is of importance with incandescent lighting.

Lighting Efficiency of Gas

The efficiency of a gas lighting unit is expressed in terms of lumen hrs. per cu. ft. of gas of given calorific value, or more precisely in terms of B.Th.U.s per lumen rate. With ordinary inverted gas mantles, the efficiency is of the order of 2.7 B.Th.U. per lumen. Superheated burners have a disc-shaped chamber beneath the burner tube with mantle nozzles, 2 or more in a cluster, attached to the lower surface of the chamber so that the ascending column of hot gases from the mantles is made to impinge upon the super-

heated chamber, and the descending air-gas mixture contained therein is preheated before being burnt at the mantle. This preheating results in a higher temp. at the mantle and, in consequence, an efficiency of the order of 2.25 B.Th.U. per lumen.

The advantages claimed for gas lighting for domestic purposes are: (i) it can be controlled at will and can be turned down, if required, without being turned out; (ii) the heat serves as useful background heating and, for certain locations and periods, is quite sufficient to take the chill off the air of a room.

Methods of switch control for indoor gas lamps include one which does not need a permanent pilot light; it consists of a fine stranded-steel cable connecting a wall switch or switches to the lamp or lamps. In the lamp is an electro-catalytic filament; in the switch box is a small dry battery. Operation of the switch causes a gas valve at the burner to open and, simultaneously, closes an electrical circuit which causes the filament to glow and ignite the gas. The arrangement allows of control from more than one point as, for example, for staircase or hall lighting from both downstairs and upstairs. Details of gas lighting for single family dwellings are given in British Standard Code of Practice, No. 34,231.

Street Lighting

The first street lighting in England was in the 15th cent., when householders in London were ordered to hang out lanterns over their doorways during winter. By the end of the 17th cent. men had made a business out of hanging these lanterns, and charging the householder for the service. The Lighting and Watching Act passed in 1833 is still in force, though supplemented by later Acts. The object of street lighting then was solely to assist in the maintenance of law and order. With the introduction of gas and electricity and the simultaneous increase in the volume of traffic, lighting of the road became also an aid to traffic.

Standardisation was first aimed at in the British Standard specification of 1931 on street lighting. This was followed by the ministry of Transport report of 1937, which recommended two standards of lighting: (1) for traffic routes, to be lighted sufficiently to render the use of headlights unnecessary; (2) for residential roads. For (1) the lamps are mounted 25 ft. above the road and the maximum average spacing is 120 ft., with the

lamps on alternate sides of the road except at bends and crossings. For (2), the lamps have a lower output and are mounted 15 ft. above the road with a maximum average spacing of 100 ft.

Criteria and Methods

Street lighting to be satisfactory must give good visibility, *i.e.* an object in the carriage-way must be seen clearly, preferably by silhouette against a bright background; there must be no source of glare; kerbs, in particular, must be well lighted to define the limits of the carriage-way to both drivers and pedestrians; there should be no abrupt changes in illumination. In street lighting, illumination values are so low that it is more practicable to light the road and surroundings than the moving object, which usually presents an almost vertical surface to be illuminated from above. One of the greatest difficulties in dealing with these low values of illumination is in overcoming the glare from the light source. This is partially achieved in the cut-off type of lantern, where the light is directed on the road at an angle of up to 70° to the vertical, so that the source is visible only up to about 150 ft. from the lantern. In the non-cut-off type of lantern the greatest amount of light is directed at an angle of about 75° to the vertical, so that reflection from the road to the observer takes place at distances up to 200 ft. or more from the lamp.

Street lighting by gas in Great Britain can be to any of the light classes prescribed by the British Standard specification for street lighting. Local authorities impose fines on the undertaking providing the lighting, payable *pro rata* to the period during which the illumination at any given test point falls below an agreed standard. Gas street lighting units in current use are all of the inverted incandescent type and are mounted on columns, or suspended centrally to give the required height/spacing ratio which, together with suitable reflectors and refractors in the lanterns, determines the requisite evenness and degree of illumination over the surface of the road. The lamps, if low pressure superheated, are supplied direct from the district mains at pressures normal for domestic consumers; if high pressure, they are supplied from separate high-pressure mains laid specifically for the purpose. The low-pressure superheated burners are similar to those used in domestic gas lighting (*v.s.*), the mantles

being arranged in clusters or in line along a rectangular superheater. High-pressure lamps require gas to be pumped from compressing plant and distributed at a pressure of 3 lb. per sq. in. The mantles are longer and considerable luminous outputs can be obtained. Lamps of this type range up to 4,500 candle power. A feature of gas lighting burners is that efficiency does not depreciate with age; there is no diminution in luminous output provided a gas mantle remains intact.

Automatic Controls

Various ingenious arrangements give automatic lighting and extinguishing of the lamps. Clock controllers with cam gearing automatically adjust the times of lighting and extinguishing to coincide with increase or decrease of hours of darkness throughout the year. One popular method of ignition is an electro-catalytic arrangement similar to that described for domestic gas lighting, except that the filament first ignites a flash pilot which, in turn, ignites the gas supply to the mantles. With high-pressure lamps it is necessary to avoid sudden ignition at full pressure, which might damage the mantles. The burner is, therefore, fitted with a thermostatically-controlled valve which, at the time of ignition, allows only a small quantity of gas to issue to the mantles at reduced pressure. As the lamp becomes warm, the thermostat opens and increases the supply until full pressure is reached.

R. N. Le Fevre

ELECTRICITY. Few, if any, houses had an electrical installation before the end of the 19th cent. Not until the evolution of the tungsten filament lamp did domestic lighting by electricity become general. Current is usually obtained from a public supply, but in isolated districts private generators are sometimes used. In non-mains installations a petrol or paraffin engine drives a generator which is in parallel with a battery. The generator produces a voltage of 25 to 220 volts according to the make and type. The engine is started and the generator then charges the battery or, if the lights are switched on in the house, holds the load. This type of equipment is trouble free as long as the engine is supplied with fuel and oil, the level of the acid is kept up in the batteries with distilled water, and the terminals are greased with petroleum jelly to prevent corrosion.

A fully automatic type has no storage battery, switching on caus-

ing a generator to start and remain running until the last appliance in the circuit is turned off. In domestic dwellings, as in factories, illumination efficiency has increased with the development of the lamp itself (see above, and Lamp, Electric). Clear glass, pearl, and opal lamps are in general domestic use. Clear lamps are suitable in fittings which completely encase them. Pearl lamps, in which the bulb itself is frosted internally, and opal lamps, in which the exterior of the bulb is coated with a thin veneer of opal glass, both give an evenly diffused illumination. Tables giving data for calculating electric lamp sizes in accordance with the standard code of illumination values are available in specialised publications—e.g. The Electrical Lamp Mfrs. Assn. No. 2 Handbook.

Types of Electric Lamp

British Standard specification No. 161 provides comprehensive information on tungsten filament general service electric lamps. Data concerning the electric study and reading table lamp is in British Standard specification No. 710; this is the only table lamp which has a specified performance, so that the user can be certain he is obtaining satisfactory lighting results. Fluorescent tubular lamps, which have revolutionised the lighting in many factories and offices since 1940, can be used for domestic lighting, especially in smaller sizes. The absence of glare from this light source makes it possible to use it for direct as well as indirect lighting; the daylight lamp, shadowless and closely approximating to daylight in colour, is particularly suitable for kitchens; for living rooms, the "warm white" lamp is preferable.

Improvements in manufacture, as well as the development of new lamps of higher efficiency, and advancements in the generation and the distribution of electricity supply have combined to bring about a substantial reduction in the cost of electric light. For example, for a penny in 1922 an average of 83 candle-hours could be obtained, while in 1938 the average was 470 candle-hours. Though the cost depends on that of the fuel available to the generating station, and is of course influenced by labour-plus-material costs over a wide range of components and raw materials, the cost of good and plentiful electric lighting is relatively low.

Socket outlets in the wiring of the normal home proved to be insufficient in number with the

advent of the mains wireless set, the electric clock, and other domestic appliances, operated from the single outlet normally available in any one room. After an inquiry carried out under the wartime social survey, a minimum schedule of lighting points in dwellings was drawn up by E.L.M.A. Post War Studies No. 12, 1944, on the lighting of buildings, published by the lighting committee of the building research board of the dept. of Scientific and Industrial Research, includes a minimum schedule of lighting points, and also the reports compiled by the wartime social survey. The L.E.S. Code of Practice for good lighting of building interiors, and the E.L.M.A. illumination handbook No. 4, Home Lighting, contain further guidance.

Since 1934 electric discharge lamps have been very widely used for street lighting. These are of two kinds: the mercury discharge, which gives a greenish light, the sodium which gives an almost monochromatic yellow. The relative initial efficiencies of the lamps are (approx.): tungsten filament 15, mercury 40-45, sodium 50-70 lumens per watt. In 1939 some 50,000 electric discharge street lamps were in use. Successful experiments have been made in the use of fluorescent lamps for street lighting; they are likely to be used in important shopping centres and other places where a high standard of illumination with good colour rendering is desirable.

Making Shop Windows Attractive

Merely increasing the brightness of illumination of a window display will attract passers-by. In a test, when the brightness per ft. length of window was raised from 15 to 100 watts, the number of persons who stopped to look at the display went up by 46 p.c. Fluorescent lighting is especially useful here, because it allows brighter displays at a cost equal to or lower than the cost of using tungsten filament lamps.

But to make a display compelling, it should be several times as bright as the surrounding area, for the eye works to a logarithmic law. Since it is impossible to concentrate fluorescent lighting into a spot, owing to the considerable dimensions of the tube, tungsten filament lighting should generally be used in addition. With this last, however, it is often essential to louver the fitting so that the observer does not get the light in his eyes, and is protected from glare.

Often coloured lighting is used to emphasise some display. At present this entails using colour filters in front of tungsten filament lamps, the effect being to filter out all the colours in the light except the one required. This is inefficient, and listed below are the percentage transmission of the colour media and the relative wattage required (relative wattage of uncorrected lamp taken as 1.0).

Colour	Transmission percentage	Wattage factor
Yellow	70	1.43
Flame	48	2.04
Orange	25	4.0
Green	20	5.0
Red	6	16.7
Blue	2.5	40.0

With further experience, coloured fluorescent lamps may become available of a relatively higher efficiency. In these the powder inside the lamp fluoresces in the colour required, and unwanted colours do not have to be filtered out.

Illumination inside big dept. stores may rise to about 50–70 lumens per sq. ft. and window illumination to about 100–200 lumens per sq. ft. Illumination intensities of this order, if obtained from tungsten lamps, produce a considerable amount of heat. For example, in a showcase illuminated to 70 lumens per sq. feet by tungsten strip lights (360 watts), the temp. rise was 22°F.; whereas in the same showcase illuminated to the same intensity with fluorescent lighting, the temp. rise was only 5°F. This reduction of heat is specially important where confectionery or flowers are displayed as heat causes them to deteriorate rapidly; it may also help to fade coloured articles. On a light output basis, the radiated heat from a fluorescent lamp is about one-fifth of that from a tungsten filament lamp.

Lamps for Floodlighting.

A building can be floodlit with tungsten filament lamps or, if a coloured effect is required, with electric discharge lamps which can produce bluish white; light or dark blue; light or dark green; yellow; red. Lamps used for floodlighting are usually of one of the following types: (1) general service tungsten gasfilled lamps, used in projectors in the 200–1,500 watt sizes. Normal gasfilled lamps are designed to operate in the cap up position; if the projector is so used that the lamp burns at an angle greater than 15° from the vertical (cap up) position, angle burning lamps are desirable.

(2) Floodlight projector (bunched filament) lamps, which have a spherical bulb enclosing a bunched filament which provides a very compact light source for projectors of narrow beam angle. (Designed for operation in any position except within 45° of the cap up position.)

(3) Mercury and sodium discharge lamps: the normal burning position for the mercury lamp is vertical, but it can be used in the horizontal position with a magnetic deflector to maintain the arc along the true axis of the discharge tube. Projectors for sodium lamps are almost invariably mounted so that the lamp is horizontal.

(4) Electric discharge colour floodlighting lamps: these provide colour floodlighting at high efficiency. They are of considerable length (40–50 ins.) and, like all other discharge lamps, require special apparatus for their control.

A. D. S. Atkinson

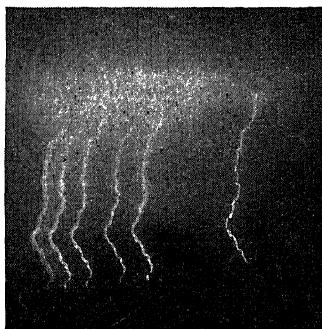
Lightning. The flash of a discharge of electricity between two clouds or between a cloud and the earth. Two main forms are frequently observed: "forked," where the path of the discharge is seen as a blinding streak of light, and "sheet," where a flickering or glowing illumination is produced in the clouds without any visible path. This latter lighting up of the sky may be due to a distant storm on the horizon or to reflections in the cloud masses overhead; no real distinction can be drawn, as sheet lightning generally results from disruptive charges and is of the same nature as forked. A flash may show many branches, especially in the upper part of one to earth. An interesting form is ball lightning. Occasionally during a thunderstorm a luminous ball, in size from a pea to a man's head, has been seen floating through the air, sometimes even appearing inside a house; these glowing

balls may vanish suddenly without noise or explode with a loud report. No adequate explanation of them has been put forward.

The simplest methods of studying lightning discharges are photographic. Early investigators who moved their cameras across the line of a discharge observed that often the flash was complex, a series of separate strokes travelling along the same path. Although four or five is the usual number, 40 successive strokes have been recorded. The time occupied by a complete discharge may exceed one second, but the component strokes last only a few thousandths of a second, and are separated by longer intervals during which faintly luminous channels can be seen. This discontinuity produces the flicker so often seen in a flash.

A great contribution to the photographic technique was made in 1926 when Sir Charles Boys invented a camera consisting essentially of two lenses which are turned rapidly about a common axis. Two photographs, taken simultaneously, provide detailed information as to the sequence of events. Beautiful photographs obtained in 1933 by Schonland in South Africa showed that whenever the difference in electrical potentials becomes sufficiently great to produce a breakdown of the air, a discharge begins with a luminous stream, or leader, moving downwards, mainly in a zig-zag manner, from cloud to earth and branching at intervals, the light travelling immediately along the different tracks. As soon as one of the branches approaches close to the ground, a much more rapid "return" luminosity travels up the conducting channels of the leader, brightly lighting both main trunk and branches. The subsequent multiple strokes of the flash generally follow more direct paths, are seldom branched, but exhibit the same dual nature.

Measurements of discharge currents by oscillographs on towers and tall buildings struck by lightning have provided quantitative data supplementing the photographic records. The average stroke is found to discharge 20,000 amperes, the maximum current measured in a complete flash being ten times as much. Flashes to electrical transmission towers usually bring a negative charge to the ground, but some flashes to high buildings have consisted of negative strokes followed by one or more positive ones. Investigations in the U.S.A.



Lightning. Multiple flash at Thames Ditton, July 14, 1945

have demonstrated that while the leader stroke to open country travels downwards from the cloud, that from the Empire State building, N.Y.C., travels upwards from the building generally without a return process.

Apart from causing casualties and damage to structures, flashes to earth arising from the development of high-voltage overhead lines linked together over large areas present a problem to the electrical engineer. The potentials of such systems have been raised several million volts during lightning storms. Before the introduction of aids giving warning of approaching storms, there were about 80 breakdowns each year over the British grid system as a result of lightning. It also causes transformer failures. The extent to which electrical storms interfere with radio transmissions is common knowledge; indeed methods of plotting the approach of storms are based on the directional recording of atmospherics due to lightning flashes. The presence of an aircraft can affect an electrical discharge in two ways. It may, by flying into an area where the field strength is just below the sparking level, produce sufficient concentration for a lightning discharge to develop. Or the highly conducting metallic structures may divert, through the aircraft, a discharge already started. If the regions of electrical activity cannot be avoided, the best protection is afforded by hauling in trailing aërials, etc. On a kite or barrage balloon the tethering cable is equivalent to a lightning conductor; thus there is danger that the cable may be struck and melted. *See Electricity; Meteorology; Thunderstorm.*

A. J. Drummond, F.R.Met.S.

Lightning. American fighter aeroplane, built by the Lockheed Aircraft corporation. It was in service with the U.S. army under the designation P-38, and also F-5 (a photographic reconnaissance version). One of the largest and most powerful single-seaters, it had a wing span of 52 ft., and two Allison in-line engines of 1,520 h.p. each. Maximum speed of the later models was 414 m.p.h. The design was distinctive, for there was no fuselage, but instead a tail-carrying boom projected behind each engine. Extra tanks gave a range of over 1,000 m. *See Aeroplane illus., p. 131.*

Lightning Arrester. Device used to protect apparatus connected with aerial wires from

lightning by providing an easy means of escape to earth. As a lightning flash has great electromotive force or intensity, it is able to leap gaps which ordinary working voltages cannot cross. The arrester commonly used for telegraph circuits consists of a fine wire which fuses when the current is excessive, and a pair of plates separated by a small air-gap. One plate is connected with the line, the other with earth. Telephone circuits are protected by a series of zinc and mica plates, arranged alternately. The mica plates have several holes in them. A zinc plate at each end of the series is connected with the line wires, and the central zinc with earth. A lightning discharge leaps from one metal plate to another through the holes in the mica, and so escapes. A larger form of this apparatus is employed on power transmission lines. The illustrations show diagrammatically two types of lightning arrester. In Fig. 1 the sides of the air-gap are continued outwards in two curving horns, H H. The choking coil C prevents the

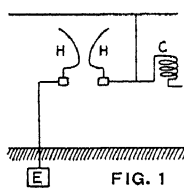


FIG. 1
Lightning Arrester.
illustrating principles of
See text

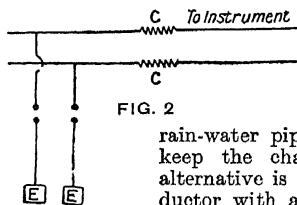


FIG. 2
Diagrams
illustrating principles of two types.

discharge from reaching power station machinery. Fig. 2 shows the connexions for the protection of electrical instruments against lightning. The choking coils C C help to check excessive flow of electric current. *See Choking Coil.*

Lightning Conductor. Metal rod or series of rods of much greater conductance than the material to which it is attached. Its purpose is to discharge electrified bodies gradually or "silently"; if a sudden lightning flash discharge occurs, it gives it a comparatively easy passage to earth. There is only one absolutely positive method of protecting a building against lightning; namely, to enclose it in a metallic sheathing. This course is normally impracticable, or entails unjustifiable expense. The "cage" system, which implies an external network of vertical and horizontal conductors connected together, is applied in various degrees to buildings which require good protection.

Conductors may be rods, ribbons, or cables of iron. Copper is more conductive, but excessive conductivity encourages surging and side-flashing; while the impedance of iron—provided the section be sufficient to prevent actual fusing—is actually an advantage. Sudden curves and angles should be avoided in a conductor, and there should be thorough metallic contact at all joints. The best form of upper terminal is a blunt cone-ended vertical spike, with three or more spikes radiating from it a foot or so below the top to form an "aigrette." It is not necessary to gild or otherwise protect the spikes against corrosion.

Conductors must not be insulated from the building, but connected with it by metal fastenings, which should project far enough to allow the conductors to clear projections in the masonry, etc. A good earth connexion, essential to efficiency, can be made by driving a perforated steel tube with pointed tip down into damp earth. The conductor, which reaches to the bottom of the interior, is

packed round with powdered charcoal, and arrangements are made to divert the discharge from a rain-water pipe into the tube to keep the charcoal moist. An alternative is to connect the conductor with a large plate of the same metal, buried in damp ground, and surrounded with charcoal.

Light of Asia, THE. Poem in blank verse by Sir Edwin Arnold (q.v.), published in 1879, with the full title of *The Light of Asia*; or, *The Great Renunciation: Being the Life and Teaching of Gautama, Prince of India and founder of Buddhism*, as told in verse by an Indian Buddhist. It gives a graphic picture of the life of Gautama as it has been handed down in legend, and a clear enunciation of his teachings as understood by a disciple. The book reached its 46th edition within ten years. *See Buddha; Buddhism.*

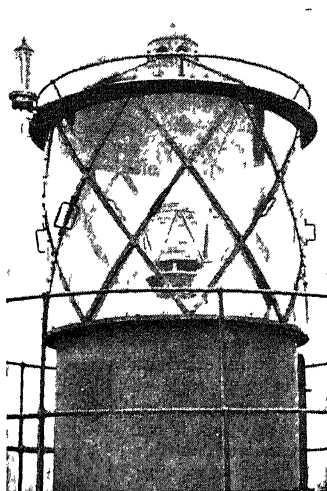
Light of the World, THE. Painting by W. Holman Hunt (q.v.). This typical Pre-Raphaelite work was painted 1851, exhibited in the Royal Academy, 1854, and, aided by Ruskin's appreciation in *The Times*, obtained extraordinary popularity. In allusion to Rev. 3, v. 20, and John 8, v. 12, the picture represents Our Lord standing at night with a lighted lantern

and knocking at a door half covered with creeping plants. He wears a long white robe, an embroidered mantle, the high-priestly breastplate, and crowns of gold and thorns. The picture was bought by Thomas Combe, whose wife presented it to Keble College, Oxford, in the chapel of which it now hangs. A second picture, slightly different, was painted by Hunt in 1900, acquired by Charles Booth, and exhibited in the colonies. It is now in S. Paul's cathedral. See Hunt, W. H., illus.

Lights. Candles and lamps as used symbolically in churches and in divine worship. Their ceremonial use is associated with the idea of a visible light as a sign of the Divine Presence, as in the Jewish Shechinah (*q.v.*), near to which a seven-branched candlestick, with lights continually burning, was placed (Ex. 25, 37; Lev. 24; 1 Sam. 3). Lights had a somewhat similar use in Pagan ritual.

In the Christian churches candles and lamps have been used symbolically since the 4th century: at baptism, as a sign of illumination by God's grace; at festivals of saints, as a sign of the entry of the saints into the light of Christ's presence; at funerals, in celebration of the Christian's entry into immortal life; and at the Eucharist, as a symbol of Christ as the Light of the World. Candles are also burnt round a catafalque (*q.v.*) and at a lying-in-state, while candles, varying in number according to the occasion, are burnt on the altar; and lamps before the altar and before shrines. See Ornament; Ritual; Rubric.

Lightship. A vessel equipped with a powerful masthead light, a foghorn, and sometimes radar and radio direction-finding apparatus. It is moored by heavy cables fore and aft and situated over a reef or shoal or at the entrance to a channel to warn



Lightship. An automatic lantern mounted on masthead of unmanned lightships. It is lit and extinguished by action of sunlight on the delicate sun-valve seen on top left

shipping of underwater obstructions. Manned lightships vary in length from 80 to 120 ft. and have displacements of up to 500 tons. They have no propulsive power. The lamp is usually on a mast or pylon some 35 ft. above water.

To prevent excessive swinging of the light with the rolling of the vessel, the beam is generally maintained in a horizontal direction by fitting the lamp in gimbals. On some ships the lamp is fixed on a table, while the lenses are balanced on a pivot in the lantern and connected by vertical wires to a weight at the centre of the vessel. Experiments have been made to keep the whole vessel on an even keel by means of a gyroscope. Illumination is provided by incandescent acetylene or oil burners. The lamp has dioptric lenses and revolves by clockwork. On a few vessels the lamp is lit by electricity. With the candle power of a lightship varying from 8,000 to 500,000, the beam is visible up to 10 m.

The first English lightship was placed at the Nore in 1732 and had an oil lantern hung at the yard-arm. This vessel was replaced by a second in 1844, which remained in service until 1936, when the present lightship was moored. Trinity House maintains 40 lightships manned by 500 men. During the Second Great War, when 16 lightships were lost by enemy action, automatic crewless vessels known as floats were placed on the E. coast, with lanterns which burned for two months.

Light That Failed. THE. Novel by Rudyard Kipling. It was published first in Lippincott's Magazine with an ending not originally planned, and issued as a volume, 1891, in its original form. It is the story of an artist who is overtaken by blindness. In the version with a happy ending he marries; in the book his old wandering taste returns and he goes off to the Sudan War—and death. A dramatised version, by George Fleming, was produced (with Forbes-Robertson) at the Lyric in 1903; and at Drury Lane, 1913; and there were two film versions, 1925 and 1940, the latter with Ronald Colman and Ida Lupino.

Light - Year. In astronomy, the unit of distance travelled in a year by light. It is equivalent to 5,878,200 million miles. It is the popular measure for the distances of stars, nebulae, etc., the scientific unit being the parsec (*q.v.*).

Ligne, CHARLES JOSEPH, PRINCE OF (1735-1814). Austrian soldier and writer. Born at Brussels, May 12, 1735, of noble family, he entered the Imperial army, won distinction in the Seven Years' War, and rose high in the service. He travelled much and frequented learned society. Essentially a courtier, he attracted Catherine II of Russia by his wit, and became a Russian field-marshal in 1787. Returning to Vienna, he resumed his friendship with the emperor Joseph II, became an Austrian field-marshal, 1809, and wrote much in retirement. Ligne died on Dec. 13, 1814. His Military, Literary, and Sentimental Miscellanies fill 34 volumes. Though he was not a great soldier his Military Fancies and Prejudices, 1780, is a classic.

Lignice OR LEGNICA. Variant Polish forms of the name of the Silesian town Liegnitz (*q.v.*).

Lignification. The alteration which occurs in the constitution of a plant cell wall when it becomes woody. It involves addition to the chief constituent of the wall, cellulose, of a group of substances among which are pentosans and aromatics. The addition may take the form of infiltration, or of chemical combination, or particles of lignin may be substituted for some of the cellulose. Lignified walls are recognized by the plant anatomist by their behaviour with certain reagents, *e.g.* the red coloration resulting from treatment with a solution of phloroglucin and hydrochloric acid.

Lignification occurs as xylem vessels, tracheids, fibres, etc.,



Lightship. The Warner Lightship, at the eastern end of Spithead, four miles east of Ryde
Cribb, Southsea

complete their differentiation from meristem cells, and usually does so when fibres in the phloem, pericycles, or elsewhere are maturing. It occurs as sclerotic cells harden off. It is commonly progressive throughout all the tissues of herbaceous stems as they complete their period of functional usefulness, and so may be considered a senile change; as it is perhaps also in the tissue elements mentioned above, whose protoplasts degenerate with the maturity of the element.

Lignin (Lat. *lignum*, wood). Organic substances forming the essential constituent of woody fibres. It is the undissolved residue after boiling wood in water and alcohol. Lignin has also been called xylogen (Gr. *xylon*, wood; and the root *gen*, to produce).

Lignite. The lowest rank of coal. Intermediate in the transformation from peat to bituminous coal, lignite retains some of the original vegetable structure and is often woody in type. It is generally brownish—hence brown coal—but black varieties occur. The U.S. geological survey classifies the compact, black types as sub-bituminous coal. Large deposits of lignite are found in Germany, the U.S.A., Canada, Australia, Malaya, etc. This is a low grade fuel; as dug, its calorific value is 5,000 to 7,000 B.Th.U. In Germany much was made into briquettes, the figure for 1937 being 42 million tons.

Probably the most important use of lignite is as a raw material for producing synthetic liquid fuel in Germany. The first commercial plant was built at Leuna in 1927. It was used initially for the hydrogenation (*q.v.*) of brown coal tar, and later of brown coal itself. By 1944 output had reached 600,000 tons per year. This was increased by plants at Bohlen, Magdeburg, Brux, and elsewhere,

working on the hydrogenation of brown coal tars. Lignite is also the source of montan wax, a valuable, brownish-black wax used in making polishes. This is extracted from the lignite by hot solvents. Small quantities of earthy varieties of lignite have been sold as pigments as Cologne Earth or Ombre de Cologne. See Coal; Fuel.

Lignum nephriticum (Lat., kidney wood). Wood celebrated from the 16th to the 18th century for its supposed medicinal properties, and for the wonderful colour effects produced by varying light upon water in which it had been steeped. Drinking cups were contrived from this wood, and when spring water had been allowed to stand for a time in the cup it became blue and beautifully opalescent, showing remarkable colour changes and shadows in light of varying strength and direction. The water so treated took up the virtues of the wood, and if drunk was said to cure diseases of the kidneys and liver. The wood was white and resembled pearwood. Chips or sawdust steeped in water in a glass or earthenware vessel gave similar results. Attention was first directed to it in 1565, by Monardes, a Spanish physician, who said the wood was imported from Mexico.

Boyle in 1663 made a series of experiments upon the colour changes of the tincture of the dark *Lignum nephriticum*, and later investigators attempted to identify the species of tree that produced the wood. The result was such confusion that even mention of the subject is lacking in modern books of reference. It was not until 1915 that the confusion was cleared up, when W. E. Safford, economic botanist to the U.S. department of agriculture, in a paper read to the botanical society of Washington, identified the light-coloured wood as that of *Eysenhardtia polystachya*, a Mexican tree, and the darker variegated kind as the produce of *Pterocarpus indicus*, a native of the Philippines. Both trees are members of the family Leguminosae (*q.v.*).

Lignum rhodium (*Amyris tozifera*) or TORCH WOOD. Evergreen tree belonging to the family Rutaceae. A native of the W. Indies, it has leaves divided into

five or seven oval leaflets. The flowers are white and clustered. The pear-shaped purple fruit has a shell which splits open when ripe. The whole tree has a balsamic odour due to a resinous fluid, and this fragrance is given off by the red wood when manufactured into articles. It is also known as Jamaica rosewood.

Lignum vitae (*Guaiacum officinale*). Tree of the family Zygophyllaceae. A native of Jamaica, it has a variegated, smooth bark.



Lignum vitae. Foliage and flowers of the Jamaican tree

The leaves are divided into two pairs of oval leaflets, and the blue flowers grow in clusters. From the stem exudes the fragrant resin known as gum guaiacum, used medicinally in chronic rheumatism, etc. It is also obtained by subjecting the wood to great heat. The wood is hard and heavy, and is therefore much in demand by turners.

Ligny. A village of Belgium. Standing 9 m. N.E. of Charleroi, in Namur prov., it is famous for the battle fought between the French and Prussians in the Waterloo campaign, June 16, 1815. This was Napoleon's final attempt to destroy the Prussian army, and thus to meet the British alone. Despite a series of mistakes occasioned by his orders to Ney going astray, Napoleon succeeded in launching a violent attack with the troops of Gérard and Milhaud, which broke the Prussians under Blücher and won the day. See Napoleon; Quatre Bras; Waterloo, Battle of.

Ligonier, JOHN LIGONIER, EARL (1680–1770). British soldier. Of Huguenot parentage, he was born Nov. 7, 1680, and entered the army. He served in all Marlborough's great battles, Blenheim, Ramillies, Oudenarde, and Malplaquet, and made himself known by his daring. He became governor of Fort St. Philip, Minorca, and held a command in the force sent in 1718 to Vigo. In 1720 he became colonel of a cavalry regiment, Ligonier's Black Horse, and in 1735 attained general's rank. He



John, Earl Ligonier, British soldier



Lignum rhodium. Flower-spray and foliage of the W. Indian tree. Inset, left, fruit; right, flower

held commands at Dettingen and Fontenoy, returning home with 7,000 men after the later battle to oppose the Jacobites, but his force was taken over by the duke of Cumberland, and in 1746 he was again in the field against the French. He served at Roucoux, and at Lawfeldt his valour in heading a cavalry charge made the French success less complete; though taken prisoner, he was soon released. In 1757 Ligonier was made an Irish viscount; his other honours included an English barony and in 1766 an earldom. He was also a field-marshal, and during 1759-62 was master-general of the ordnance. He died April 28, 1770. A nephew succeeded to the Irish peerage, but the English titles became extinct.

Ligule. Botanical term applied to certain strap-shaped structures in plants; e.g. the chief part of the corolla of the ray florets of composites like the daisy, or the scaly outgrowth from the top of the leaf sheath of grasses and from the inside of petals of some Caryophyllaceae flowers. Ligules also arise from the leaves of Isoetes and from the sporophylls in the cone of Selaginella.

Liguori, ALONSO MARIA DEI (1696-1787). The founder of the order of Redemptorists (*q.v.*). He was born near Naples, Sept. 27, 1696, and six years after his ordination founded in 1732 his order of mission priests, of whom he was the Superior for the rest of his life. He was a voluminous writer, especially on moral theology, and his system of casuistry (*q.v.*) is widely used. Liguori was one of the leading defenders of the doctrine of the immaculate conception. He became a doctor of the R.C. Church, and his published works extend to 42 vols. He died Aug. 1, 1787, and was canonised in 1839.

Liguria. Name of a division of ancient Italy, and of the modern compartimento embracing the provs. of Spezia, Genoa, Savona, and Porto Maurizio. Its area is 2,098 sq. m., and pop. 1,535,976. The ancient div. was larger than the modern, and extended from Nice to the river Macra, that separates it from Etruria, and as far N. as the river Padus or Po. Liguria, first invaded by the Romans in 238 B.C., resisted for more than a century before becoming a subject region.

Ligurian Alps. Mt. range of N. Italy. The most S. section of the Alpine curve, the mts. lie between the Maritime Alps and the lower

ground N.W. of Savona. The Col di Tenda (6,145 ft.), at the W. end, is the chief pass, and E. of it the Mongioja massif rises to 8,629 ft., and sends out spurs which overlook the Riviera from heights exceeding 6,000 ft. The E. portion is much lower, and is farther back from the Mediterranean. *See* Alps.

Ligurian Apennines. A mt. range of N. Italy. It curves round the Gulf of Genoa from Savona to Spezia. The W. section is relatively low, and the range exceeds 7,000 ft. E. of Genoa, where the seaward slopes of the Riviera di Levante are very productive, on account of their sunny aspect. With the Ligurian Alps, the mts. provide a physical barrier which tends to isolate Genoa from Lombardy.

Ligurian Republic. The name given to the republic of Genoa as reconstituted by Napoleon. The French fomented a feud between the democrats of Genoa and the pro-Austrian aristocrats, and the suppression of a revolt, in which some French subjects fell, gave Bonaparte a pretext for transforming the oligarchy into a moderate democracy under a directory on the French model, June 6, 1797. The treaty of Campo Formio, Oct. 17, transferred the imperial enclaves in Genoa to the Ligurian republic. On June 29, 1802, Napoleon Bonaparte substituted for the directory a government by a senate, and a doge appointed by himself. The republic was annexed by France in 1805. *See* Genoa.

Ligurian Sea. Portion of the Mediterranean Sea. It lies between Corsica and the mainland; its northern section, bounded by Liguria, is the Gulf of Genoa. *See* Mediterranean Sea.

Li Hung-chang (1823-1901). Chinese statesman. Born at Hofei in Nganhui, Feb. 16, 1823, he had



Li Hung-chang,
Chinese statesman

a brilliant scholastic career and next distinguished himself as a soldier in the actions against the T'ai-p'ing rebels, over whom, in 1859, assisted by Gordon's army, he gained a final victory culminating in the reduction of Soochow and Nanking, in 1864. Gordon had stipulated that the lives of the rebel chieftains in Nanking should be spared, but Li Hung-chang secretly saw to their execution, a piece of

treachery that so infuriated Gordon that he would have shot Li with his own hand had not the Chinese made his escape. Li was now the governor of Kiangsu and the recipient of many honours. Viceroy of Hukwang, 1867-70, in the latter year he was transferred to Chihli, became royal tutor, and turned his attention to fostering trade between China and the west.

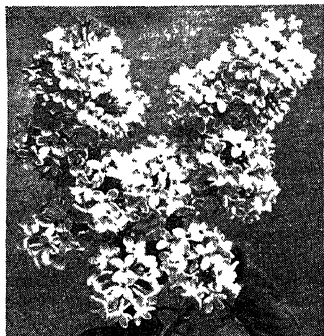
His great opportunity came with the death of the emperor T'ung-chi in 1875. Li, by skilful use of the military, placed Kwang-Su, a child of five, on the throne under the regency of his two aunts, and himself became the leading spirit in the government. His endeavour to make China militarily efficient had, however, failed, and she suffered an utter defeat in the war with Japan, 1894-95. The following year he visited Europe and U.S.A. After a brief period as foreign minister, he successfully put down the Boxer rebellion of 1901 and died Nov. 7 the same year. A Life by J. O. P. Bland appeared in 1917.

Liim Fjord or **LIM FIORD.** Inlet of the sea, extending across North Jutland from the Kattegat to the North Sea. About 100 m. in length and 1 m. to 14 m. in breadth, it comprises a series of salt water lagoons whose depth rarely exceeds two fathoms, and has been made into a nursery for young plaice. It contains the large island of Mors and several smaller ones. There are many small towns on its shores. The fjord is crossed by rly. bridges.

Likewake or **LYCHWAKE.** Custom of watching by a dead person during the period between death and burial, lych meaning a body. *See* Lych-gate; Wake.

Likoma. Island in Lake Nyasa, Africa. It is 30 m. S. of the N. boundary of Mozambique and is the headquarters of the Universities' Mission to Central Africa, having an Anglican cathedral. In 1892 the diocese of Likoma was separated from that of Zanzibar.

Lilac (*Syringa*). A genus of shrubs of the family Oleaceae, natives of Asia and E. Europe. The common lilac (*S. vulgaris*), familiar in gardens, attains a height of about 20 ft. and has smooth heart-shaped opposite leaves and small fragrant flowers in pyramidal clusters, blue, red, violet-purple, or white in colour. Rouen lilac (*S. chinensis*) is a probable hybrid between *S. vulgaris* and *S. persica*. *S. emodi*, from the Himalayas, has longer flowers, purplish or white, in more open clusters. *S. josikaea*, from Hungary,



Lilac. Flower clusters of the common variety

differs from the other species in being almost without scent. *S. japonica* has creamy-white flowers. The wood of the common lilac is fine grained, and is used in inlaying and turning.

Lilacs may be planted in gardens in autumn or spring, and are propagated from seeds or suckers. They are improved by moderate pruning after they have finished flowering, and, where grown in poor soil, benefit by an occasional application of liquid manure. They may be forced in pots at a temperature of 60° F. during the winter, and syringed freely, subjected otherwise to ordinary greenhouse treatment.

Lilburne, JOHN (c. 1614-57). English political agitator. Born at Greenwich, he was educated at



John Lilburne, English agitator

Newcastle and Auckland, and apprenticed to a London cloth merchant. In 1637 he was charged before the star chamber with circulating unlicensed books, and was whipped, pilloried, and imprisoned until 1640. From prison he began that pamphlet warfare which he carried on all his life. He rose to be lieutenant-colonel in the parliamentary army, but was one of the extremists known as Levellers (*q.v.*), and resented Cromwell's assumption of power. A courageous advocate of the rights of the people, he was undaunted by any parade of authority, and became an idol of the London populace. He died at Eltham, Aug. 29, 1657, having been released from prison nearly two years earlier on becoming a Quaker.

Liliaceae. Extensive family of (mostly) perennial herbs with bulbous or creeping root-stocks.

The leaves and flowers vary greatly in the 250 genera. In many the flowers are very large and few, as in *Lilium*, *Tulipa*, and *Fritillaria*; or they may be small and inconspicuous as in *Ruscus* and *Asparagus*. The sepals and petals are alike, so they are termed perianth segments, as a rule six in number. The fruit is a capsule or a berry. Some 2,500 species flourish in all climates. Onions, lilies-of-the-valley, and hyacinths are among the Liliaceae.

Lilienthal, DAVID ELI (b. 1899). An American administrator Born at Morton, Ill., July 8, 1899, he graduated in arts at De Pauw university, and in law at Harvard. In 1931 he became a member of the Wisconsin public service commission. He made a national reputation as chairman of the Tennessee Valley Authority in 1933. Head of the American committee for inquiring into methods of applying international control to atomic energy, he made a report which served as the basis for American proposals to that end in 1946, and was chairman of the U.S. atomic energy commission, 1946-50.

Lilienthal, OTTO (1848-96). A German engineer and flying pioneer. Born May 23, 1848, at Anklam, and trained as a mechanical engineer, he was the first man to demonstrate practically the great superiority in lifting power of curved or cambered aeroplane



Otto Lilienthal, German engineer

wings over flat ones. He made over 2,000 glides, imitating the soaring flight of birds, and the careful observations which he took enabled the brothers Wright to initiate their first successful flying experiments. His gliders were originally monoplanes but he later designed the first biplane glider, flying which he crashed in a sudden gust of wind, Aug. 9, 1896, dying next day.

Lili Marlene. German song. Written without score by Hans Leip, 1923, it was set to music by Norbert Schultz, 1938, and was first sung in a Berlin night club by Lala Andersen, Swedish cabaret artist. The song was recorded but did not prove a success and was almost forgotten until April, 1941, when the Germans occupied Belgrade. Belgrade radio became an important link in the Nazi propa-

ganda network, and old gramophone records were played to fill gaps between the news items. Lili Marlene was among these, and so many requests for it were received from German soldiers that eventually the song was broadcast every 20 minutes. It was adopted as a marching song by the Afrika Korps, and a Berlin radio programme for soldiers was built up round it, in which Lala Andersen sang in person. A Lala Andersen relief fund for troops was opened, and a statue of the singer erected on the Smolensk road. Versions of the song were written for Germans serving on the Russian, African, and Italian fronts. Towards the end of the war Lala Andersen was sent to a concentration camp for criticising the Nazi régime.

Tank crews of the British 8th Army in N. Africa listened to the German forces programme, and adopted Lili Marlene as a marching song, whence it spread to all the British armies. In 1944, T. Carner and J. Turner wrote an English version, using the German music, for a M.O.I. film, *The Story of Lili Marlene*.

Lilith. Female nocturnal demon in Babylonian and Jewish folklore. The name is connected with the Heb. *lilûtu*, night. Lilith is mentioned in Is. 34, 14 (R.V. marginal note), where it is said



Otto Lilienthal in his biplane glider in 1896. It weighed about 50 lb., and was controlled by the pilot's body movements

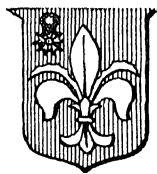
Photo, Science Museum, S. Kensington

that she shall settle among the ruins of Edom. She was considered dangerous, especially to children, and was dreaded by Mesopotamian Jews until the 7th century. The Rabbis held that she was Adam's first wife before her transformation into a demon. This legend has been dealt with by modern poets and by painters. Lilith is a character in Bernard Shaw's *Back to Methuselah*.

Liliuokalani, LYDIA KAMEKEHA (1838-1917). Queen of the Hawaiian Islands, 1891-93. Born Sept. 2, 1838, she was sister of King Kalakaua I, whom she succeeded. Having married John O. Dominis of Boston, who was made governor of Oahu she favoured American interests, but after his death her attitude towards white residents led to her deposition, 1893, and the formation of a republic, 1894. In 1898 the islands were formally annexed by the U.S.A. Ten years later she made a claim against the U.S.A. on the ground that American troops had taken part in her deposition; this was disallowed, but a pension of \$8,000 was granted her. She wrote over 100 Hawaiian songs, and a history of the islands. She died at Honolulu, Nov. 11, 1917.

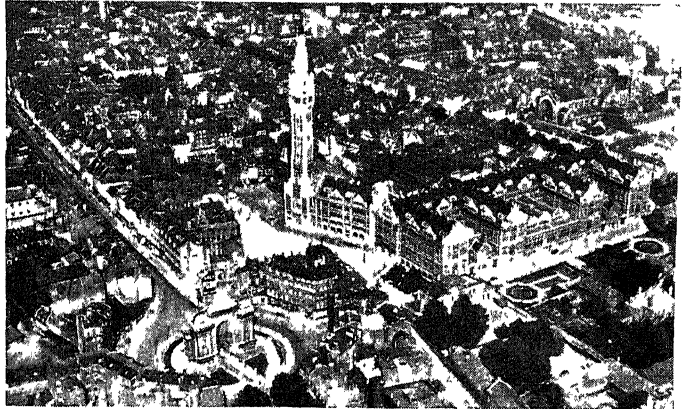


Liliuokalani, Queen of Hawaiian Islands



Lille arms

Lille (Flem. Ryssel). City of France, capital of the Nord dept. It lies on the river Deule, 32 m. S.E. of Dunkirk, 155 m. N.E. of Paris. Fifth in size of French cities, it is one of the most important industrial centres of the country. Up to 1914 it was a fortress of the first rank, with fortifications originally constructed, under Louis XIV, by Vauban, and several times extended and brought up to date. These partly determine the character of the city; but it also has long, wide streets and beautiful boulevards and squares, while the surrounding suburbs, mostly separately administered, are largely industrial. They connect Lille with the surrounding towns, and the whole area is the centre of France's textile industry. There are also engineering works, chemical works, clothing factories, and a state-owned tobacco factory.



Lille. Air view of the French city, showing the Belfry and the Hôtel de Ville, with the Porte de Paris in the left foreground

Among Lille's older buildings are the churches of S. Maurice (14th-15th cent.) and S. Catherine (15th-16th cent.), the stock exchange, the guards' barracks, and the handsome Porte de Paris (1685). The cathedral, the Palais des Beaux Arts, the university buildings, the town hall, and the Rihour and Rameau palaces are mainly 19th century. The Palais des Beaux Arts contains one of France's finest art collections, with valuable specimens of Dutch and Flemish painting and the famous coloured wax bust of the "beautiful girl of Lille" (16th cent.).

Lille is also an educational centre, with a state and a R.C. university, commercial and technical colleges, agricultural colleges and research stations (with botanic garden), a Pasteur institute modelled on that of Paris, and colleges of art, architecture, music, and dentistry, and for the training of teachers. The library possesses over 1,400 old MSS. There are several museums.

An important rly. junction, Lille is the main market for a rich agricultural area, especially in the flax trade. Pop. pre-war, 201,568.

Lille originated from a castle of Count Baldwin of Flanders (d. 878). This was called L'Isle, and gave its name to the town, which is registered as from 1127. After belonging successively to Flanders, Burgundy, and Austria, besieged and conquered by Louis XIV in 1667, it came to France, was captured by Eugene of Savoy in 1708, was reunited with France in 1713, and resisted a siege by Austrians in 1792.

In the First Great War, Lille was taken by the 6th German army in Oct., 1914, and remained under German occupation for exactly four years. It was one of the

main strategic objectives of the Allied armies, but they refrained from shelling it. Nevertheless it suffered great economic damage. Industry remained at a standstill throughout the war, and requisition and deportations were carried out on a large scale. The city was enveloped by the British advance of 1918. The Germans evacuated it on Oct. 17, 1918, after much deliberate destruction of rlys. and machinery.

In the Second Great War it was again in German occupation from May 29, 1940, to Sept. 4, 1944, when the city was "captured" by three British soldiers, who found the F.F.I. already in control, the main German force having withdrawn. Chief material damage in the Second Great War was from Allied air raids on rly. and industrial installations.

Lillebonne. Town of France, in the dept. of Seine-Inférieure. It lies in the wooded hilly country of the Seine valley, 20 m. E. of Havre, on a branch rly. line from Bréauté-Beuzeville, and has local agricultural trade. There are remains of a castle built by William the Conqueror. The Roman name was Julobona, chief town of the Caletes, whose name is preserved in the Pays-de-Caux.

Lilleshall. Village in Shropshire, England, 3 m. S. of Newport. It is famous for the hall, long the residence of the duke of Sutherland but now a country club. Here, too, are the remains of Lilleshall Abbey, founded in 1145 for Augustinian canons; these include the remains of a fine Norman church. The old church of S. Michael contains memorials of the Leveson family.

Lilliburlero. A song of the Protestant party in Ireland during the Revolutionary period of 1688.

The doggerel words, in which an imaginary Irishman rejoices over James II's appointment of a Roman Catholic king's deputy (lord-lieutenant), were written in 1687 by the 1st Marquess of Wharton, and Purcell set them to his own arrangement of an old quickstep tune. The song, becoming immensely popular throughout England, Scotland, and Protestant Ireland, had an extraordinarily political effect, and Wharton claimed that it had "danced James II out of three kingdoms." Many other words, usually of Protestant origin, were later set to the tune, e.g. The Protestant Boys, an Orangeman's song. The tune was popular among soldiers (Uncle Toby, in Sterne's *Tristram Shandy*, hummed it continually), but in the 19th century it was officially discarded by the British army in deference to the feelings of R.C. soldiers in Irish regts. But it was re-adopted as a march by commando units in the Second Great War, and frequent broadcasts of the tune gave it a new lease of life. References to the original ballad and its influence are found in Macaulay's *History of England* and Burnet's *History of Music*.

Lillie, BEATRICE (b. 1898). A Canadian-born British actress. Born at Toronto, May 29, 1898, and educated there, she made her first stage appearance at Chatham in 1914, and in London during the First Great War established her reputation as a comedienne with an outstanding gift for satire. She played in London and New York in revue and light comedy, e.g. *This Year of Grace*, 1928; *Charlot's Masquerade*, 1930; *Happy Returns*, 1938; *Words and Music*, 1939; *Big Top*, 1942; *Better Late*, 1946. She appeared in *Too True to be Good*, 1932. In 1920 she married Sir Robert Peel, 5th baronet (d. 1934). Their son Robert, 6th baronet, was killed in the Second Great War, 1944.

Lilliput (dialect Eng. *lille put*, little fellow). Imaginary island in the Indian Ocean to which Swift's Captain Gulliver journeyed on his first voyage. The inhabitants were people not six inches high, hence the word lilliputian has come to signify anything very small. (See Gulliver's *Travels*.)

Lilliput is the name of a monthly "pocket" magazine, the first of its kind in Great Britain. Founded 1937 under the editorship of Stefan Lorant, it became well-known for cartoons, humorous articles, and photographs wittily paired to show ludicrous resemblances.

Lilly, WILLIAM (1602–81). English astriologer. Born at Diseworth, Leics, April 30, 1602, and educated at Ashby-de-la-Zouch, he left for London in 1620, came into money by marrying his master's widow, in 1632 turned his attention to astrology and medicine, and issued prophetic pamphlets and almanacs. He was a friend of Ashmole, and died at Hersham, June 9, 1681. In addition to his astrological works and an autobiography, 1715, repr. 1832, he wrote *The True History of King James I and King Charles I*, 1651. He was the Sidrophel of Butler's *Hudibras*.



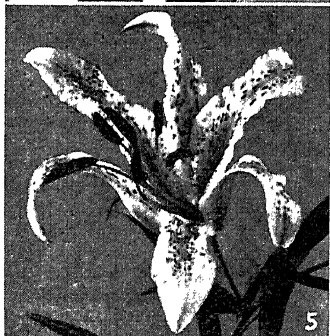
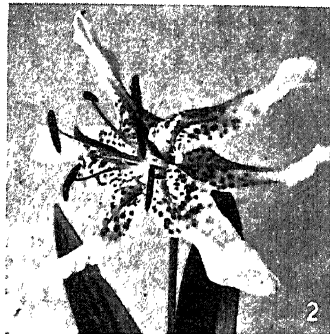
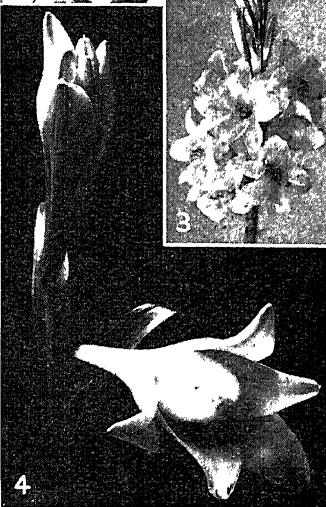
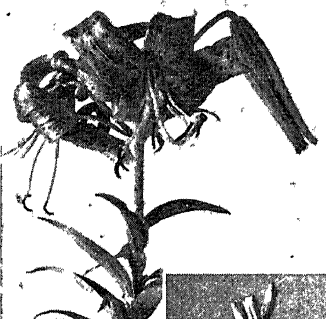
William Lilly,
English astrologer

Lillywhite, FREDERIC WILLIAM (1792–1854). An English cricketer. He was born near Goodwood, Sussex, June 13, 1792. Though exhibiting cricketing prowess as a boy he did not become a professional until middle age, playing his first match at Lord's in 1827. He was engaged by the M.C.C. as a bowler in 1844, and was connected with the club until his death from cholera on Aug. 21, 1854. From 1851 to 1853 he acted as cricket coach at Winchester College. He was the first notable round-arm bowler.

Lily (*Lilium*). Genus of bulbous plants which are natives of the temperate regions of the world. Most of them grow wild in E. Asia, some in Europe and W. Asia, others in N. America. They vary in height from 18 ins. (*L. pumilum*) to 10–12 ft. (*L. giganteum*), and among them are some of the fairest garden flowers. A few will flourish in the ordinary loamy soil of gardens; for most of them sites must be prepared correctly. Some are difficult; others, not hardy, can be grown only under glass. Numerous lilies have been raised from



F. W. Lillywhite,
English cricketer
From a print



Lily. 1. Tiger lily, *Lilium tigrinum*. 2. *L. speciosum*. 3. Madonna lily, *L. candidum*. 4. Bermuda lily. 5. Golden-rayed lily, *L. auratum*

seeds and many new ones obtained by hybridisation; thus home-grown bulbs are available and they have proved more suitable for cultivation than imported ones.

Most lilies should be planted so that the base of the stem is in shade and the upper part can reach the sunshine. Ideal positions are in the spaces between shrubs and herbaceous border plants. The time of planting and depth at which to set bulbs are important; many are best planted in autumn, others in Feb.-March. Lilies which make roots on the stem as well as below the bulb are planted 6-8 ins. deep; others which root only from the bulb need a covering of 3-4 ins. of soil.

Some lilies of Europe and W. Asia are *L. candidum* (Madonna lily), *L. croceum* (orange lily), *L. pyrenaicum*, *L. chalcedonicum* (scarlet Turk's cap), *L. pomponium* and *L. Martagon*. *L. testaceum* (Nankeen lily), a hybrid between the Madonna and scarlet Turk's cap, needs the same treatment. These should be planted in early autumn in loamy soil with the addition of a little leafmould and sand. Lilies are not a success in poor ground which dries out quickly; most fail in soil containing lime, but the following are exceptions: *L. candidum*, *L. testaceum*, *L. croceum*, *L. chalcedonicum*, *L. pomponium*, and *L. Martagon*.

Among lilies of E. Asia, none is so widely grown as *L. regale*, which bears large trumpet-shaped fragrant flowers, white flushed with purplish rose. Other beautiful examples are *L. auratum*, *L. Henryi*, *L. Davidii*, *L. Willmotiae*, *L. tigrinum* (Tiger lily), and *L. speciosum*. The bulbs should be planted in autumn or early spring on sites prepared by digging deeply and by mixing leafmould and sand freely with the garden soil. They must be placed 6-8 ins. deep.

Some N. American lilies are difficult to cultivate successfully, but *L. pardalinum* (panther lily), *L. nevadense*, *L. Roezlii*, *L. canadense*, and *L. superbum* are easily grown. The first three thrive under conditions similar to those needed by the E. Asiatic flowers. *L. canadense* and *L. superbum* must be planted in slight shade in moist soil consisting of peat and leafmould. The Easter lily (*L. longiflorum*) requires glass except in mild districts. *L. giganteum*, most remarkable of all, should be planted in leafmould in partial shade, the tops of the bulbs just below the surface. This bulb dies

after it has flowered. Consult *Lilies: Their Culture and Management*, H. D. Woodcock and J. Coutts, 1936.

H. H. Thomas

Lily of the Valley (*Convallaria majalis*). Hardy perennial herb of the family Liliaceae. A native



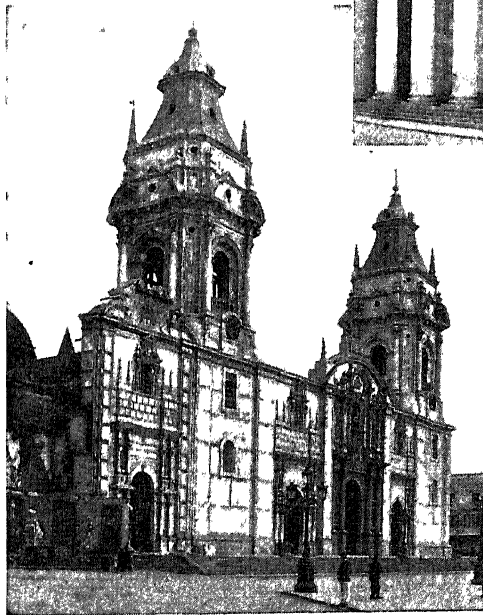
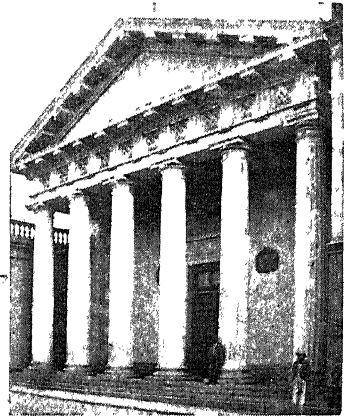
Lily of the Valley.
Flowers and leaf

of Great Britain and N. Asia, it has oval leaves and bears white, bell-like, fragrant flowers on erect stems in spring. The rootstocks should be planted in autumn in any mixture of ordinary garden soil, with

a predominance of leafmould. The beds should have a top dressing of well decayed manure in Feb., and the crowns should be lifted and replanted every five

Andes. The towns in the valleys are populous, and the soil, watered by the Rimac, Río Grande, Mala, and Chancay, is fertile. The sugar cane is cultivated, and minerals include silver, copper, and nitre. Vicuña wool and chinchilla skins are exported. Area, 15,048 sq. m. Pop. 828,298. See Callao.

Lima. City of Peru, capital of the republic and of the dept. of the same name. On the river Rimac, 7 m. E. of its port, Callao, it is connected by rly. with Cerro de Pasco. The city is laid out on the square system, and has many open plazas, the chief of which is the



Lima, Peru. Western façade and main doorway of the cathedral. Top, right, portico of the senate house

years. Lilies of the valley are invaluable in the shady corner of the town garden. They may be forced in pots with ordinary greenhouse treatment, but the crowns are useless afterwards.

Lima. Metropolitan and maritime dept. of Peru. It is bounded on the N. by the dept. of Ancash and on the S. by Huancavelica and Icar, and is traversed by the

Plaza de Armas, or Plaza Mayor, the centre of business. The city was formerly walled, but fine boulevards have taken the place of the ramparts. In the cathedral, founded in 1535 by Pizarro, his remains are preserved. The building was destroyed by an earthquake in 1746, but rebuilt. Other prominent buildings are a university founded by Charles V in 1551, the oldest in America; an archiepiscopal palace, town hall, mint, and senate house. Here is the supreme court of Peru. The city possesses zoological and botanic gardens, and an immense bull-ring. Manufactures include pottery, silverware, textiles, paper, tobacco, soap, dyestuffs, cocaine, furniture, aeroplanes, copper and iron articles, sugar, and cocoa.

Lima was founded and laid out by Pizarro in 1535, and became

the capital of the Spanish viceroyalty of Peru, and of the republic after the termination of the Spanish domination. From the earthquake of 1746 it recovered slowly. In 1880 it was occupied by the Chilean army. Many of the old Spanish buildings have been replaced by ferro-concrete structures. Besides its rlys. and trams, Lima has good roads radiating from it. About 500 ft. above sea level, it has an annual mean temp. of 66° F. Pop. 628,821.

Lima. City of Ohio, U.S.A., the co. seat of Allen co. On the Ottawa river, 80 m. S. by W. of Toledo, it is served by rlys. Near it is the state hospital for insane criminals. The industrial establishments include petroleum refineries, locomotive and machinery works, and rly. repair shops. Lima was founded in 1831, and became a city in 1842. Pop. est. 45,923.

Liman von Sanders, Otto VICTOR KARL (1855-1929). German soldier, born at Stolp, Prussia, June 16, 1855. He entered the army in 1874. In 1913 he became a general, and being ennobled added von Sanders to the family name. In 1914 he was sent to Turkey, and was commander-in-chief of Turkish forces opposing the Allies in Gallipoli in 1915. After the death of von der Goltz, he directed the Turkish armies in the Middle East, and in 1918 was in command in Palestine and Syria when Allenby conquered those countries. He surrendered to the Allies, was interned in Malta, and released in 1919. He published *Five Years of Turkey*, Eng. ed. 1928. He died Aug. 22, 1929.

Limassol. Seaport and second largest town of Cyprus. It stands on Akrotiri Bay, on the S. coast, 37 m. S.W. of Larnaka, near the site of the ancient town of Amathus. The chief exports are carobs, wine, plaster of Paris, and salt. It was the scene in 1191 of the wedding of King Richard I and Berengaria. Pop. 22,693.

Lima-wood. Important red wood used in dyeing. It is related to Brazilwood (*q.v.*).

Limber. The detachable two-wheeled portion of a mobile gun-carriage travelling behind the tractor and in front of the gun. The limber forms a box for the ammunition. To limber up means to attach the gun to the limber; and in another sense, to exercise the limbs before a race, etc.

Limbourg. Prov. of Belgium. It lies W. of the Meuse and adjacent to the Dutch prov. of

Limburg, with which it was formerly united as part of the duchy of Limburg. It contains the E. section of the Campine coalfield, and is an important industrial district. Bog iron ore is obtained here in considerable quantities. The capital is Hasselt. The town of Limbourg, until 1648 the capital of the duchy, is N.E. of Verviers in the prov. of Liège. Area, 930 sq. m. Pop. est. 443,758.

Limburg. Prov. of the Netherlands. It lies partly E. of the River Maas (Meuse), which flows throughout its length, between that river and Germany. Before 1839 the area formed part of the duchy of Limburg. It includes the highest ground in the country, with hills of glacial debris about 150 ft. high, is mainly an agricultural area, and is noted for its cheese. S.E. Limburg has the only coal mines in the Netherlands. The capital, Maastricht (*q.v.*), is the chief centre for manufactures. Area, 846 sq. m. Pop. est. 671,677. See Limburger Cheese.

Limburg. Ancient town of W. Germany, in the *Land* of Hesse. It is known as Limburg-on-Lahn, to distinguish it from Limburg-on-the-Lenne, or Hohenlimburg, in Westphalia. It stands on the Lahn, 22 m. N. of Wiesbaden. The chief building is the grandiose S. George's cathedral with seven towers, built in the 10th century and restored in the 19th. There is an old castle and a modern town hall. The manufactures include cloth, machinery, and railway stock, while around are iron mines. In the Middle Ages Limburg was the chief town of a *gau*, or county. Afterwards it was included in the electorate of Treves. In 1803 it was given to Nassau, passing to Prussia in 1866. In Sept., 1796, the Austrians defeated the French here. The Limburger Chronicle is a work of value for the history of the Rhineland in the 14th cent. Pop. 12,000.

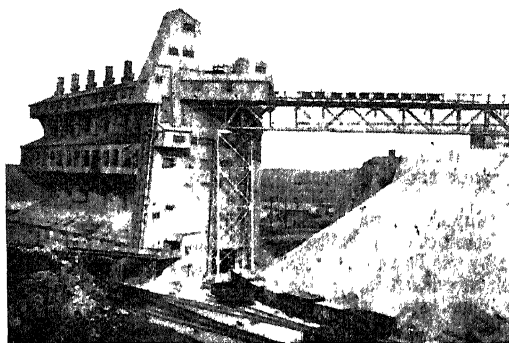
Limburger Cheese. Variety which takes its name from the Netherlands prov. of Limburg, where it is made, as also in adjacent districts of Germany and in Alsace, in the first half of the year. It is of whole milk, fermented, and has a strong flavour and even stronger smell, by which it has acquired a notoriety beyond its merits.

Limburgite. In geology, a variety of basalt consisting of olivine and augite crystals in a glassy base. It is named from Limburg in Germany.

Limbus OR LIMBO (Lat., fringe). Theological term for an intermediate state between death and the last judgement. It was first used in the Middle Ages for the place occupied by the souls of the just who died before Christ's coming, and for those of unbaptized infants who died after that event. Schoolmen of the 12th-13th centuries divided the intermediate state into five divisions: Paradise, reserved for the saints of the O.T., those released from Purgatory, and martyrs; *Limbus patrum* (of the Fathers), or Abraham's bosom (Luke 16), for those who merited rest, but not the perfect joy of Paradise; *Limbus infantium* (of infants), for unbaptized infants, sometimes identified with *Limbus patrum*; Purgatory, for the baptized who need salutary pain to fit them for heaven; and *Infernum*, for those who are without hope of anything but hell, the final place of torment. Dante represents *Limbus* as the outer zone of hell (*Inferno*, canto 4). Cary translates the word Limbo, but this spelling is rejected by many on account of its ribald association, *e.g.* in Shakespeare's *Henry VIII*, Act v., Sc. 3. See Hell; Purgatory.

Lime. Oxide of calcium (CaO), often called quicklime to distinguish it from slaked lime, which is formed when quicklime is treated with water. Lime is prepared by burning suitable grades of limestone (*q.v.*). The decomposition, $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$, occurs at ordinary pressures at temp. between 1,200 and 1,300° C. The art has been practised since early times and is described by Theophrastus (c. 300 B.C.). The process consisted in building a pile of limestone and lighting a fire in a suitable cavity; or alternate layers of fuel and limestone were fed into a shaft usually placed at the foot of a hill, so that it could be filled at the top, the mixture of burnt lime and fuel ash being withdrawn at the bottom. Such a kiln could be operated continuously.

Modern practice demanding lime conforming to rigid specifications, the industry has become centralised so that large quantities are made under scientific control and with the utmost economy. Increasing use of carbon dioxide in the chemical industries has made its recovery important. In the later types of kiln the fuel is kept away from the lime, the hot exhaust gases are used to preheat the air blast, and the carbon dioxide is recovered. Rotary



Lime. Battery of patent lime kilns at Hindlow
Photo, Imperial Chemical Industries

kilns similar to those used in cement (*q.v.*) manufacture, were first introduced successfully in 1893. They have the advantage that smaller pieces of limestone can be used and temp. control is easy.

Lime is an important raw material in many industries. In the manufacture of cement, limewash, and distemper, efficacy depends upon the formation of the insoluble carbonate from the soluble hydrated (slaked) lime by absorption of carbon dioxide from the atmosphere. Hydraulic lime comes from limestones containing clays (aluminium silicates). In agriculture, the effect of lime is to reduce acidity and to fix ammonia. It is an essential constituent of food for both plant and animal life. In the metallurgical industry lime and limestone are fluxes; for smelting iron ores 1,000 tons of steel require 500-1,000 tons of lime or limestone. In the ammonia soda process for the production of caustic soda, manufacture of bleaching powder, water softening, and leather manufacture, lime is an essential raw material. See Cement; Limestone.

Lime (*Tilia*). Small genus of deciduous, mostly lofty trees. They are natives of Europe, Northern Asia, and N. America. They have alternate heart-shaped leaves with saw-toothed margins, the two sides unequal in size. The sweet-scented flowers, produced in cymes, are yellowish-white or greenish-white, and have sepals and petals in fives, with numerous stamens.

Two species, the broad-leaved lime (*T. cordata*) and the small-leaved lime (*T. parvifolia*), are natives of Britain, and the common lime (*T. europaea*) from Europe and the Caucasus is naturalised. The light, white, fine-grained timber is not strong enough for the structural purposes for which its large barks would appear to make

it suitable; but it is in demand for cabinet-work, musical instruments, and carving. The masterpieces of Grinling Gibbons were wrought in lime. Lyne, linde, and linden are other old English forms of the name. See Bract; Bud.

Lime Fruit (*Citrus limetta*). Small tree of the family Rutaceae, native of Asia. It

bears a round or oval, pale yellow fruit, with a nipple-like prominence at the top, and has acid juice. It is usually known as sweet lime, to distinguish it from the West Indian lime, a variety of the citron (*C. medica*), from which citric acid and commercial lime juice are obtained. See Citron; Lemon.

Limehouse. District of London, England, in the "east end." It is in the borough of Stepney, 2½ m. E. of Fenchurch Street. Deriving its name from limekilns which once existed here, of which Limekiln Dock is a reminder, and familiar as London's Chinatown, it has many foreign sailors and dock workers among its population. The church of S. Anne, built by Nicholas Hawksmoor in 1712, was burnt in 1850; the line tower is part of the original structure. The Sailors'

Palace, headquarters of the British and Foreign Sailors' Society, was opened 1903. Another building is the Strangers' Home for Asiatics, Africans, and South Sea Islanders. The Grand Union Canal here enters the Thames; Limehouse Cut connects with the River Lea through Poplar; and Limehouse Reach divides the Surrey Commercial and the West India Docks. Limehouse is referred to by Shakespeare, Stow, and Pepys, and figures in the pages of Dickens and



Lime Fruit. Leaves, fruit, and, inset, flower of sweet lime

Besant. The word Limehouse became a synonym for violent political language following a vituperative speech against the house of lords made here in 1909 by David Lloyd George (see Lloyd-George of Dwyfor, 1st Earl). C. R. Attlee represented Limehouse in parliament continuously from 1922 until the disappearance of the div. in the redistribution of 1950.

Limeira. Town in the state of São Paulo, Brazil. On the Paulista rly., it is the centre of orange cultivation in the state, with a modern American packing house. There are mulberry groves, silk-worm culture, and manufactures of matches and hats. Pop. 20,000.

Lime Juice. Liquid expressed from the fruit of the lime fruit tree, cultivated for its fruit and juice in Italy, Jamaica, Montserrat, Trinidad, and Dominica. Concentrated juice is utilised for the manufacture of citric acid. A remedy against scurvy, it is less efficacious than lemon juice. See Citron; Lime Fruit.

Limelight. Intense brilliant white light produced by heating lime to incandescence in an oxygen-hydrogen or other high-temperature flame. It is sometimes known as the Drummond light, after its inventor, Thos. Drummond (*q.v.*). Once used in magic lanterns and for stage effects, it has been superseded by electric lighting.



Lime. Tree in full leaf. Top, left, flower; right, fruit

Limerick. A county of Eire. In the prov. of Munster, its area is 1,037½ sq. m. It is bounded by the Shannon on the N., and by Cork, Kerry, Clare, and Tipperary. The chief rivers are the Mulkear, Maigue, and Deel, all tributaries of the Shannon. Much of the county is level, but in the S.E., on the Tipperary border, are the Galty Mts., with Galtymore, over 3,000 ft. high. It is served by the Eire state rlys. Limerick is the county town; others are New-castle, Rathkeale, Bruff, Askeaton, and Adare. Askeaton and a small place, Kilmallock, were once represented in the Irish parliament; the co. now sends 7 members to the Dáil. Agriculture is the chief industry, and much of the land, being part of the Golden Vale, is regarded as the most fertile in Ireland. Cattle, sheep, and pigs are reared, and there are a number of dairy farms. Limerick was part of the kingdom of Thomond. In the Middle Ages it had famous abbeys at Adare, Askeaton, and Kilmallock. There are remains from pre-Christian times. Pop. 142,211.

Limerick. Maritime city of Eire and the co. town of Limerick (*v.s.*). It stands on the Shannon, 129 m. S.W. of Dublin by rly. Situated on both sides of the river, here crossed by five bridges, it consists of English town, on King's Island in the river, Irish town, and New-

town Pery, the modern portion. The old buildings include the Protestant cathedral of S. Mary, built in the 12th cent., but much restored, and King John's Castle. In the city is the stone on which the treaty of 1691 was signed. As a port, Limerick's pre-eminence is due to its position where the Shannon becomes navigable, while it is connected with the interior of Eire by canals. There are

graving and floating docks and extensive quays. The chief exports are dairy produce, for which it is one of the country's main centres. Ten thousand pigs are slaughtered weekly for bacon-curing establishments. There are foundries, tanneries, condensed milk factories, and flour mills, while the city is noted for its lace.

Limerick existed in the first centuries of the Christian era and about 820 was taken by the Danes. About 1100 the Irish recovered it, and it became the chief town of Thomond, this period lasting until the arrival of the English c. 1174. The latter made their settlement on the island, which they fortified, and it became a corporate town in 1197. In 1651 it was taken by Ireton and in 1691 by the troops of William III. Its fortifications were pulled down after 1760. In 1763 Newtown Pery was founded. The city returned two M.P.s from 1800 to 1885. Market days, Wed. and Sat. Pop. 42,522.

Limerick, SIEGE OF. English enterprise that in 1691 gave the final blow to the cause of James II. In Aug., 1690, after the battle of the Boyne, Limerick was besieged by William III and defended by Sarsfield, who destroyed the siege guns. Abandoned for a time, partly through the effects of bad weather, the siege was renewed, Aug. 11, 1691, by Ginkel, after the Irish army had been defeated at Aughrim. The town capitulated on Oct. 3, in accordance with a treaty by which it was agreed that all arms, property, and estates should be restored, all attainders annulled, all outlawries reversed, that no oath but that of allegiance should be required, that the Irish Roman Catholics should be free in the exercise of their religion, and that all who wished should be free to emigrate to France. Sarsfield and others entered the French service, but the treaty was annulled in 1695 by the Irish parliament.

Limerick. Form of comic verse. It consists of five lines in ana-

paestic metre; the first, second, and fifth lines rhyme, having three feet each, as do the third and fourth lines, with two feet each. The origin of the name is doubtful. It cannot come, as is often said, from "Learick," as though Edward Lear were the inventor, for the form occurs in a chapbook of c. 1820 before Lear began to write. But it was he who popularised the limerick in his Book of Nonsense Verse, setting the standard opening of "There was a young man (or old man, young woman, etc.) of" . . . some geographical place. The whole point of a good limerick is in its witty or nonsensical conclusion. The importance of the last line was stressed during the vogue, in 1907, for "last line" competitions in the popular press. Cf. Clerihew.

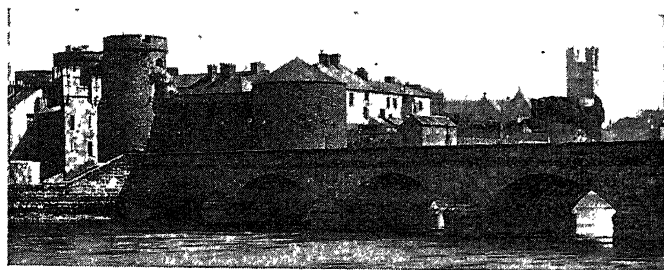
Limestone. Sedimentary rock consisting chiefly of calcium carbonate. Limestones may be of chemical or organic origin. The former result from precipitation of calcium carbonate from sea or lake water. Organic limestones are aggregates of shells, shell fragments, coral reefs or coral sands, cemented together by consolidated calcareous muds. Chemically formed limestone often has an oolitic texture; it is made up of small spherical grains of calcite and has the appearance of fish roe (*Gr. oion, egg*). Such rocks are now being formed on the Bahama Banks. They are also found in the Jurassic limestones of the U.K., and make valuable building stones. Impurities in limestones are muds, sands, siliceous skeletons of organisms, flint or chert, and iron or magnesium carbonates. Dolomite has equal amounts of calcium and magnesium carbonate. Chalk is a soft earthy variety of limestone composed of the remains of minute foraminifera. Limestone is the product of deposition in clear but not necessarily deep water. Fossils are common, mostly thick shelled species typical of shallow water environment.

Solution is the main factor in the weathering of limestones. Joints and cracks are enlarged, pot-holes and caverns are dissolved out, and streams are deflected underground. Surface soil is washed down these solution channels, and exposed bare rock traversed by enlarged fissures is characteristic scenery of limestone regions.

The well-known quarries of Portland, Bath, Cheltenham, and near Oxford, are in oolitic limestones of Jurassic age. Many coloured limestones containing fossils



Limerick city arms



Limerick, Eire. Thomond Bridge, reconstructed in 1839, crosses the Shannon to Limerick Castle, built in the time of King John

will take a good polish and are used as internal ornamental stones. Hard limestones from the Pennines and Buckfastleigh make road metal. Where limestone and clay are available together they can be quarried for cement manufacture; in S.E. England chalk and alluvial mud are used. Limestone and chalk are both burned for lime used in building and in agriculture.

Important limestones of Great Britain are the Durness of Cambrian age in N.W. Scotland; the Wenlock and Aymestry of Shropshire and Herefordshire; Devonian of Plymouth and Buckfastleigh; the Carboniferous of the Pennines, Wales, Mendips, and Bristol; Jurassic oolitic of Dorset, Cotswold, and Yorkshire; and the Chalk of the S.E. and Lincolnshire and Yorkshire Wolds. See Cement; Karst; Lime; Rock.

Lime Water. Solution of calcium hydroxide, $\text{Ca}(\text{OH})_2$. It has a medicinal use in being mixed with milk to prevent the formation of curds in infant feeding. Mixed with olive oil it forms carron oil, once popular as a remedy for burns but now outdated.

Limitation (Lat. *limes*, boundary). Term used in English law. It denotes the duration or mode of devolution of an estate. Thus, if land is given to A for life and after A's death to B and his heirs, the words for life and his heirs are words of limitation, limiting or defining the estates of A and B.

The word has a second meaning, this having regard to actions at law. In English law actions cannot be brought after a certain period has elapsed. By the Limitation Act, 1939, the period is six years from the date on which the cause of action accrued in actions on a simple contract, or on tort. An action on a deed or to recover land cannot be brought after twelve years. The period is extended where the person claiming has been under any disability or where there has been an acknowledgement or part payment.

Limited Liability. Term used in English law. It began with joint stock enterprise. The English law of partnership makes every partner liable to the last penny for every debt of the partnership; his private property being as much answerable as the partnership property. When, therefore, enterprises on a large scale began, it became necessary for the partners, or shareholders as we now call them, to obtain the privilege of forming a society, whose members should bind themselves to contribute so much each,

and whose liability for the debts of the concern should be limited to the amount of the promised contribution.

This idea became common in the early days of railway construction; but the privilege of limited liability could be obtained only by royal charter or private Act of Parliament. Finally the Limited Liability Act, 1855, provided for the creation of joint stock enterprises with limited liability; and this was followed by the Companies Act, 1862, which allowed any seven persons who pleased to form themselves into a company with limited liability.

There are two forms: (1) liability limited by shares, where the capital of the company is divided into shares of a fixed denomination, e.g. 10,000 shares of £1 each; the members apply for such shares as they are prepared to subscribe for; and each subscriber's liability is limited to the amount of the nominal value of his shares; (2) liability limited by guarantee, where each member simply guarantees to contribute so much in the event of the company being wound up. All such companies must describe themselves as limited. By the Limited Partnerships Act, 1907, partnerships with limited liability may now be formed, but this is hardly ever invoked. See Company Law; Partnership.

Limnaea (Gr. *limnē*, lake). A genus of gastropod molluscs found in fresh water, and known as water or pond snails. The horny brown shell is formed in a conical helicoid spiral; the animal, like all pulmonates, uses the mantle cavity as a lung, coming to the surface at intervals for air. It has the power of floating foot upwards at the surface of the water, and progressing by undulatory movements of the foot. It feeds upon aquatic vegetation, and at times on decay-



Limnaea. Shell of *Limnaea stagnalis*

ing animal matter; the eggs are deposited in gelatinous masses, often on the stems of plants. There are six British species, which include most of the larger water snails except the flattened or trumpet-like species (*Planorbis*). *L. truncatula* is the intermediate host of the liver fluke (*q.v.*).

Limnanthemum (*Nymphoides pellatum*). Round-leaved buckbean, or floating heart. A perennial aquatic herb of the family Gentianaceae, it is a native of Europe and Asia. It has a creeping rootstock and bright yellow flowers.

Limnanthes Douglasii. Annual herb of the family Limnathaceae. It is a native of California.

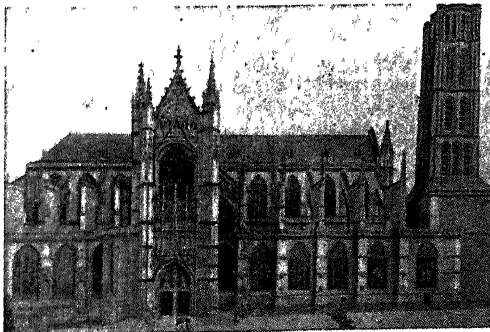


Limnanthes Douglasii. Foliage and flowers of this Californian herb

The leaves are deeply cut from the edges into oblong leaflets, and the flowers are large, fragrant, yellow.

Limoges. A town of France, capital of the dept. of Haute-Vienne. It lies on high ground on the right bank of the Vienne, 251 m. by rly. S.S.W. of Paris. It is an important rly. junction, and has a number of porcelain factories.

The cathedral of S. Étienne was founded in 1273, and has a 14th cent. choir; the N. portal, early 16th cent., and rood loft, 1534, are noteworthy. Other churches of interest are S. Michel-des-Lions and S. Pierre-du-Quey-roix. There is a museum with a collection of



Limoges, France. Cathedral of S. Étienne, from the north, showing the 16th century north portal

Lawrence

ceramics, and a palais de justice. Limoges derives its name from the Gallic tribe known to the



Limoges arms

Black Prince in 1370. In the 16th century it was famed for its magnificent enamel work, and was once capital of the province of the Limousin. Pop. 107,874.

Limoges. Hard paste china-ware manufactured at Limoges. It has a hard, tough, semi-transparent body, brilliant glaze, and remarkably good colouring. It dates from about 1764, after the discovery of kaolin. See Enamel; Pottery.

Limón OR PUERTO LIMÓN. Chief seaport of Costa Rica. It stands on the Caribbean coast, and is the terminus of the inter-oceanic rly. to Punta Arenas, being 102 m. by rly. E. of San José. It is the seat of a bishop. Pop. 17,065. Limón gives its name to a prov. with pop. 40,117.

Limonia acidissima. Spiny shrub or small tree of the family Rutaceae. It is a native of India. The leaves are cut up into opposite leaflets, and the fragrant red flowers are clustered. The small reddish fruit contains an acid, flesh-coloured pulp used in Java as a substitute for soap, and in Malabar as a medicine.

Limonite. An important ore-mineral of iron, consisting of yellowish to brown hydrated oxide of iron of no definite composition. Limonite is amorphous and earthy, often associated with goethite. It results from the decomposition of other iron-bearing minerals, and is abundant in the oxidised outcrops (gossans) of sulphidic ore bodies, particularly those containing much pyrites. Sometimes iron is carried down in water to swamps and lakes where bacteria help in the precipitation of limonite to form bog iron ores, as in Sweden. Limonite forms part of the Jurassic iron ores in England, and is the predominant mineral in the great ore-bodies of Alsace-Lorraine. Shades of yellow and brown in many clays and sands often show its presence.

Limousin. One of the provinces into which France was divided before the Revolution. The name commemorates the Lemovices, a tribe inhabiting the region in the

time of Julius Caesar. It was part of the Frankish empire and kingdom, but decreased to a small province around its capital, Limoges, with the dukes of Aquitaine as its overlords until it passed to the kings of France in the 14th century. It is now represented by the departments of Haute-Vienne, Corrèze, and Creuse, and parts of Dordogne and Charente.

Limousine. A type of body formerly seen on chauffeur-driven motor cars. The roof of a limousine was fixed and extended from the extreme rear to the pillars of the front windscreen. The rear compartment was entirely enclosed and had two doors and drop windows. It contained a fixed seat across the back and two folding occasional seats. A glass partition separated the driver from the passengers. The limousine has now largely been replaced by the pullman saloon.

Limpet. Group of marine gastropod molluscs in which the shell is conical or tent-shaped. There are numerous species found in most parts of the world, some being extremely common around the British coasts. The animal adheres tightly to the rock by means of its foot, which acts like a sucker; and moves about and grazes on minute vegetation when the tide is up, always returning to the same spot before the tide ebbs. Like many Gastropoda, it grazes by means of the radula or lingual ribbon, which has numerous rows of hook-like teeth. Limpets are used for bait, and in some places for food. See Mollusca.

Limpopo, OORL, INHAMFURA, OR CROCODILE. River of S. Africa. It rises in the S.W. portion of the Transvaal, forms the boundary of this prov. with Bechuanaland and S. Rhodesia, then enters Mozambique, and runs altogether 800 m. to the sea, which it enters 55 m. N. of Delagoa Bay. Its numerous headstreams drain the high veld N.W. of Pretoria. The chief tributaries are the Olifants river and the Magalakwin, Motamba, Inharrimé, Notwani, Marico, and Elands rivers. Certain portions only are navigable; the main difficulties are the Tolo Azimé Falls, and little water during the dry season.

Linaceae. Family of herbs, shrubs, and trees, natives of all regions. They have simple, un-

divided leaves, and regular flowers in five parts, red, blue, yellow, or white in colour. They have diuretic properties, and the seeds are rich in oil, whilst the fibrous bark provides raw materials for the textile industries. See Flax.

Linacre, THOMAS (c. 1460–1524). English scholar. Educated at Canterbury and Oxford, he was



Thomas Linacre, English scholar

soon interested in the new learning. Visiting Italy, he met a number of scholars and princes, and next passed some time at Oxford. He studied medicine also in

Italy, and in 1509, having already been tutor of Prince Arthur, became physician to Henry VIII. In 1520 he became a priest, and died Oct. 20, 1524. Counting Erasmus, More, and Colet among his friends, Linacre was a ripe Greek scholar, and the founder of the Royal College of Physicians.

Linares. Inland prov. of Chile. Lying between the provs. of Talca, Nuble and Maule, and Argentina,

its area is 3,790 sq. m. Wholly mountainous, it is fertile in the N. and well wooded. The prov. is traversed by the Central Chilean rly. Pop. 134,968.

Linares. Mining town of Spain, in the prov. of Jaén. It stands in a fertile plain near the S. spurs of the Sierra Morena. Trade is

carried on in wine, oil, and cereals, but the main industries are connected with the silver, lead, and copper mines. Pop. 47,723.

Lincluden OR LINCLUTHEN. Ruined abbey of Kirkcudbrightshire, Scotland. It is at the junction of the Cluden and the Nith, 1½ m. N.W. of Dumfries. It was founded in the 12th cent. At the Reformation it fell into ruins.

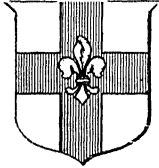
Lincoln. British heavy bomber aircraft, manufactured by A. V. Roe & Co. The Avro Lincoln was an enlarged development of the Lancaster (q.v.), but was too late to be used for operations in the Second Great War. It was powered by four engines of the same type as those fitted to the Lancaster (Rolls-Royce Merlin), and took the same maximum bomb load (22,000 lb.), but had a higher



Limpet. Shells of the common limpet, *Patella vulgata*

all-round performance—top speed of 310 m.p.h. and extreme range with 3,000 lb. of bombs of 4,450 m. Wing span was 120 ft., length 78 ft. 3½ ins., and all-up weight 82,000 lb. This was the first British bomber to mount 20-mm. cannon.

Lincoln. City, county borough, and county town of Lincolnshire, England. It stands on the Witham, 130 m. N. of London, and has two rly. stations. One M.P. is elected and the est. pop. is 66,270.



Lincoln arms

The cathedral of the Blessed Virgin Mary is one of the most magnificent in England. Of the original structure, begun about 1074, all that remains is part of the west front. Most of the present edifice was erected between 1200 and 1500. Mainly built from the designs of Bishop Hugh, it stands on a hill commanding the city. Its many beautiful features include S. Hugh's choir, the Angel choir, the three towers, the chapter house, and the choir stalls. The windows and carvings are also notable. In the central tower is the bell, Great Tom of Lincoln. The library was built by Wren. Here is one of the four contemporary copies of Magna Carta.

Lincoln has many priceless antiquarian remains. A portion of the Roman wall still stands, and some parts, the keep among them, of the castle built by the Normans. More complete is the Roman gate known as the Newport Arch. The Jews' House and the house of Aaron the Jew are old examples of domestic architecture. A 12th century building called John of Gaunt's stables, but really the hall of S. Mary's Guild, is a reminder that Gaunt had a palace here. S. Peter at Gowts and S. Mary le Wigford are old churches, though with modern additions. The cathedral buildings include the old episcopal palace, partly restored, and the new one. Of the city's gates the exchequer gate and the Pottergate still stand. Above another gate, the Stonebow, is the guildhall, with fine timbered roof. On the old bridge that crosses the Witham are some houses. Modern buildings include the county hall, corn exchange, Usher art gallery, grammar school, hospital, and library. The city and county museum is housed in the 13th century priory of Grey Friars.

Centre of a farming area, the city has works for making agricultural

and other machinery. There are also maltings and flour-mills. Horse and cattle fairs are held. Races at Carholme include the Lincolnshire Handicap at the start of the flat racing season.

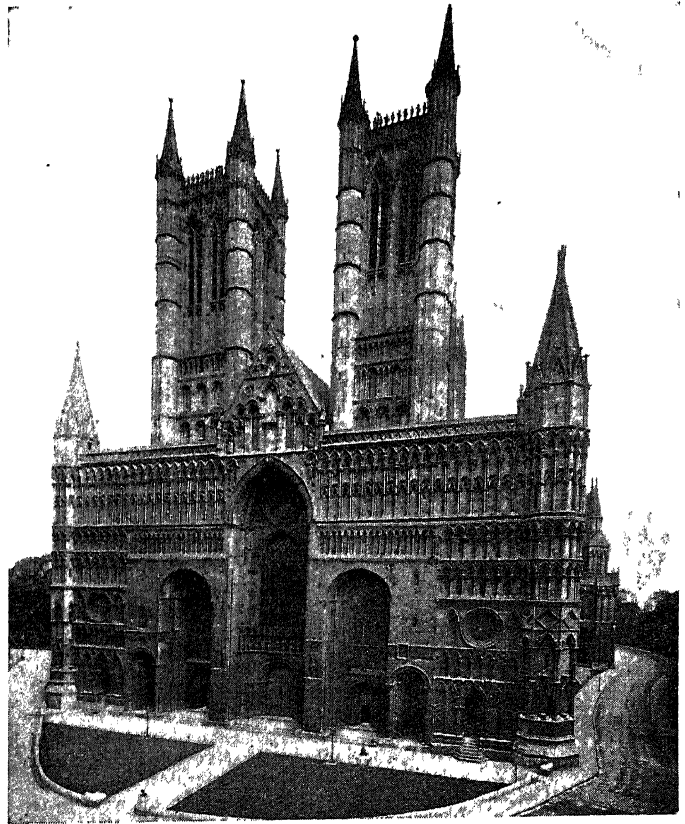
Lincoln began as a British station. From c. A.D. 48 it was the *landum Colonia* of the Romans, an important place, as numerous remains prove. The Anglo-Saxons restored it, and later it was occupied by the Danes. William I built here a strong castle and made it the seat of a great bishopric. There was much fighting for the castle during the civil war between Stephen and the empress Matilda.

Lincoln. A city of Illinois, U.S.A., the co. seat of Logan co. It is 28 m. by rly. N.E. of Spring-



Lincoln, England. The High Street, over which can be seen the dominating position of the cathedral above the city

field. The seat of Lincoln university, it has also a state school for weak-minded children, and the old court house in which Abraham Lincoln practised as a lawyer. Coal mining, flour milling, and the manufacture of boots and shoes, motor horns, furniture, and machinery are carried on. Citizens of Lincoln are responsible for a state law of 1889 forbidding the ownership of Illinois land by aliens.



Lincoln. West front of the cathedral, showing the two western towers in the Late Decorated style

Settled in 1835, Lincoln was incorporated in 1854 and became a city in 1857. Pop. 12,752.

Lincoln. Second largest city of Nebraska, U.S.A., capital of the state, and co. seat of Lancaster co. It is 56 m. S.W. of Omaha and is served by several rlys. The see of a Roman Catholic bishopric, it is the seat of the state university, state college of agriculture, Nebraska Wesleyan university, and Union College. Here is the flying school where Lindbergh learned to fly, 1922. The most impressive building is the capitol, a two-storey limestone edifice with a 400-ft. tower surmounted by a gold glazed-tile dome on which stands a 27-ft. bronze figure, the sower, symbolising Nebraska's dominance as a grain producer.

Lincoln is a beautiful city outside the industrial area. Centre of an important farming region, it ships grain, and has large flour mills and creameries; manufactures include meat and other food products, rly. goods wagons, bricks and tiles, and chemicals. U.S. govt. surveys of the salt beds here attracted settlers, 1856, who called their community Lancaster. The salt works closed in the 1860s, but a legislative commission 1867 chose Lancaster as site of the new capital (displacing Omaha), and it was renamed Lincoln, becoming a first class city 1887. W. J. Bryan lived here. Pop. 81,984.

Lincoln. Mt. of Colorado, U.S.A. A peak in the Park Range of the Rocky Mts., it rises to 14,297 ft.

Lincoln, EARL OF. English title now borne by the duke of Newcastle. The first earldom was created in the 12th century, and in 1232 it was granted to John de Lacy. Henry Lacy, 3rd earl, was a soldier of the time of Edward I; he led the English in Gascony, and later was one of those who helped Thomas, earl of Lancaster, to humiliate Edward II. Thomas became his son-in-law and inherited his earldom, which remained for some time in the Plantagenet family. In 1572 Edward, 9th Lord Clinton, was made earl of Lincoln, and his descendant, the duke of Newcastle (q.v.), holds the title today. The third earl gave his name to Lincoln's Inn, where his London residence stood.



Édward de Clinton,
1st Earl of Lincoln
After Ketel

ABRAHAM LINCOLN: HIS LIFE & WORK

Godfrey Rathbone Benson, 1st Baron Charnwood

This biography is supplemented by the article on the American Civil War, and the biographies of generals who played leading parts therein, e.g. Grant, Jackson, Lee, and others. See also Slavery; United States: History

Abraham Lincoln was born Feb. 12, 1809, in Hardin co., Kentucky, the son of a shiftless, migratory farmer, Thomas Lincoln, and his wife, Nancy Hanks. The family descent has been traced back to a Samuel Lincoln of Norwich, who emigrated to America and settled in Massachusetts about 1638. Abraham was early left motherless; his father married again, and with his family moved from place to place. At twenty-one he began his independent life as a labourer in Illinois with twelve months' schooling behind him, and soon gained a reputation for prowess in wrestling, for honesty, good nature, and a gift of humorous and somewhat crude story-telling.

During the next few years Lincoln lived a varied life. He helped his father to clear his holding, made two trips to New Orleans, where he saw something of the horrors of slavery, and took out some volunteers to serve in the Black Hawk War. He began his political career as a candidate for the legislature of Illinois, after which he became partner in a store at New Salem, and postmaster of that town. His store failed, and during these years he gained some experience as a surveyor.

By this time Lincoln had read much, and had decided to become a lawyer. He obtained his certificate and began to practise at Springfield. In 1834 he had been elected to the legislature, and there entered a protest against slavery and made his name as a ready speaker. In 1846 he was elected to congress on the Whig ticket, but remained there only four years, declining to offer himself for election in 1850. He had married Mary Todd and entered upon partnership with W. H. Herndon. In 1854 he was a respected lawyer, fond of his children, but addicted to solitary thought, and withal a disappointed politician.

Then the rashness of Senator Stephen Douglas (q.v.) of Illinois precipitated the long suppressed struggle between the states which had abolished and those which had retained slavery, and between those who would restrict and those who would extend it in the western territories subject to the union of the states. The Republican party was

formed, pledged to prevent all further extension of slavery, while respecting the constitutional right of the slave states to their slaves. This balanced position precisely expressed Lincoln's own thoughtfully matured and ardently held convictions. He became a local leader. His brilliant oratorical contest with Douglas in Illinois in 1858 was of national importance, in keeping the faltering Republican party to its principles. In 1860 a turn of the political game made him the first Republican president.

He was elected on the principle that slavery was wrong; though he resolutely opposed any unconstitutional attack by outsiders on slavery where it was already lawful. With Lincoln the maintenance of the Union was the primary concern, but Southern statesmen felt, as he did, that his policy would surely undermine slavery. Accordingly South Carolina seceded from the Union. The administration was helpless, and when Lincoln entered office in 1861, seven states had formed a new confederacy. To the president and the North generally, secession appeared legally and morally treasonable. But there were eight slave states, still adhering to the Union, which might secede if the right to do so was contested. The Civil War ensued and lasted over four years.

The president's achievements may be summed up by saying that



A. Lincoln

the strain of this long trial fell chiefly on him, while he upheld the North and held it together. Inexperienced in affairs, he formed an able and representative cabinet, including his chief rivals, and by adroitness and unselfishness kept it working well, despite the ministers' jealousies of himself and of one another. In foreign affairs, Seward, his greatest competitor,

pletteness of victory, he laboured to prepare a reconstruction of the South, in which revenge would be absent, and revived prosperity and loyalty possible. Lee surrendered April 9, 1865.

On April 14, after speaking in his cabinet words of pardon, intensely congenial to him, Lincoln went to the theatre, where a fanatic actor J. W. Booth (*q.v.*), shot him.

He died next morning. Innumerable tongues told tales of his shrewdness and his compassion. His melancholy and his humour became blended in a vivid but indescribable portrait for popular imagination. Soon the scholarly

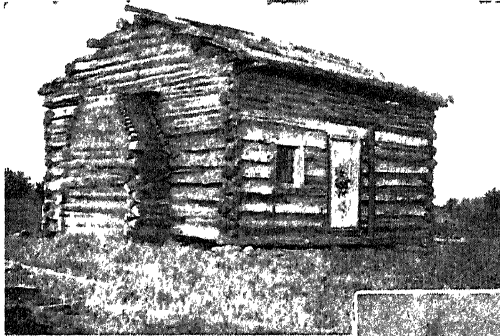
ington. See American Civil War; Gettysburg Address; Lincoln Memorial.

Bibliography. Complete Works, 12 vols., ed. J. G. Nicolay and J. Hay, 1905; A. L., a History, 10 vols., Nicolay and Hay, 1890; Lives, W. O. Stoddard, 1884; W. H. Herndon and J. W. Weik, 1892; J. T. Morse, 2 vols., 1898; N. Hapgood, 1899; I. M. Tarbell, 2 vols., 1900; J. G. Nicolay, 1906; A. Rothschild, 1906; Lord Charnwood, 1919; E. Ludwig, 1930; E. L. Masters, 1931; Carl Sandburg, 4 vols., 1939; L. the President, J. G. Randall, 1945. A chronicle play, Abraham Lincoln, by John Drinkwater, had a marked success when produced at Birmingham, 1918, and in London, 1919.

Lincoln, TIMOTHY TREBITSCH (1879-1943). A Hungarian adventurer. Born at Paks, his real name was Ignaz Trebitsch. He tried the stage and journalism, then became a rabbi; later he was baptized a Presbyterian in Hamburg. In 1900 he went to Canada, where he was ordained in the Church of England, and in 1903 became curate of Appledore, Kent. Naturalised British in 1910, he was elected Liberal M.P. for Darlington, but lost his seat next year, and went to

Rumania to recoup his fortunes in oil speculation. Back in England on the eve of the First Great War, he was employed as a censor in the post office; suspected of espionage, he fled to the U.S.A. The British government secured his extradition in 1916, and he was sentenced to three years' imprisonment for forgery. His naturalisation was revoked and on release he was deported.

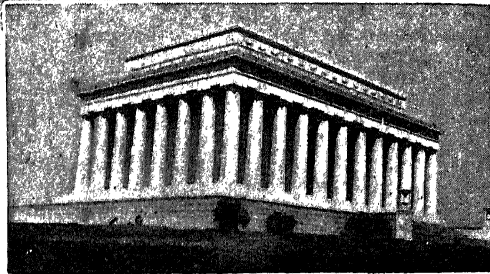
In Germany he took part in the Kapp *putsch* for the restoration of the monarchy. He went to the Far East, joined the staff of the Chinese war lord Wu-pei-fu, and became a Buddhist. As a monk in Ceylon, he heard in 1926 that his son, John Lincoln, had been condemned to death for murder. He tried to see him, but was again deported, and left England vowing vengeance. In 1934, now calling himself the abbot Chaokung, he tried once more to enter England, but was sent back to China. In the China-Japan conflict he sided with the invaders, and was reported in 1942 to be broadcasting Japanese propaganda from secret



converted from a mutineer to a loyal coadjutor, learned from him prudence. At the treasury his detractor, Chase, stayed unhampered as a sound administrator.

The navy owed much to Lincoln. His embarrassments for want of good generals were terrible. Thus before 1863, when he could leave military matters to Grant, in whom he had early believed, Lincoln often interfered with them, but reluctantly. His patience and his kindness in dealing with men were incomparable, and he could be inexorably firm. Meanwhile, distrusted and blamed by both sections in the North, Lincoln had silently watched until, at the end of 1862, it became practicable by an act of martial law to emancipate all southern slaves within the reach of the Northern armies, and to enlist many. This death-blow to modern slavery was struck at exactly the right moment. It fell to Lincoln next to enforce conscription, and loyally to support subordinates who, often indiscreetly, were maintaining order in parts of the North which were disaffected.

As victory approached, weariness occasioned much agitation for negotiations which would have imperilled, and compromise which would have destroyed, the indissoluble character of the Union. Lincoln remained unyieldingly set upon the complete surrender of the South, and after some months of intense reaction among politicians the people re-elected him in 1864. While ensuring the com-



Abraham Lincoln. Memorial erected by the state of Virginia at Washington, D.C., 1920-21. Top, left, log cabin in Kentucky where the future president was born

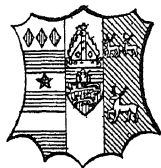
world discovered the charm and perfection of his restrained oratory. Later study revealed a profundity in his thought, *e.g.* the human wisdom of his unique feeling towards the negro.

Historical inquiry tends to show him a statesman where once he seemed a patient, honest blunderer. In any case, his combination of simplicity with a touch of indefinable genius, of forceful ambition with all but absolute unselfishness, of a delightful cunning with transparent honesty, of unsubduable humour with a prevailing tragic melancholy, of proved and iron fortitude with an ever-deepening tenderness, has made him one of the best-beloved public men in the history of the English-speaking peoples.

In 1919 Barnard's statue of Lincoln was unveiled in Platt Fields, Manchester, and in 1920 a replica of the figure by St. Gaudens in Lincoln Park, Chicago, was unveiled opposite Westminster Abbey. In 1922 a magnificent memorial presented by the state of Virginia was erected in Wash-

radio stations in Tibet. His death in Shanghai, following an intestinal operation, was announced by the Japanese on Oct. 9, 1943.

Lincoln College. One of the smaller colleges of the university of Oxford. It was founded in 1427



Lincoln College arms

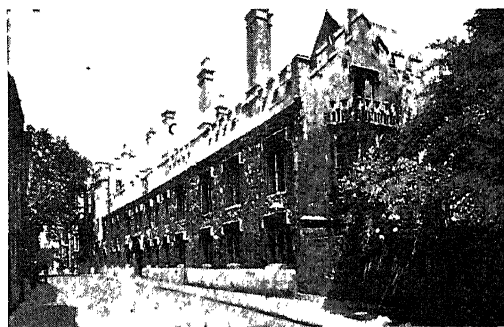
by Richard Fleming, bishop of Lincoln, being dedicated to the Blessed Mary and All Saints, and reconstituted and newly endowed in 1478, by Thomas Rotherham, archbishop of York and lord high chancellor. The foundation consists normally of a rector, 12 fellows, and 14 scholars. Mark Pattison was rector of Lincoln, and other famous members of the college were Sir William Davenant, Viscount Morley, and Edward Thomas. John Wesley is the most celebrated name on the roll, and it was here he started his evangelistic work. The buildings are situated in Turl Street; the hall dates from 1436.

Lincoln Judgement. Decision on ritual by the archbishop of Canterbury. In 1888 a prosecution was instituted against Bishop Edward King of Lincoln, for eight ritual acts alleged to be illegal, among which were the use of lighted candles at Holy Communion, the mixing of water with the wine in the chalice, the Eastward position, the ablutions, and the sign of the cross. The case was tried by Archbishop Benson in 1889, and after lengthy argument he pronounced all the acts complained of to be legal, with the exception of the sign of the cross in benediction, and the performance of the manual acts out of sight of the congregation. The promoters appealed against this judgement to the judicial committee of the privy council, who heard the arguments in 1891 and confirmed the archbishop's decision on all points. See Oxford Movement; Ritual.

Lincoln Memorial. Erected in honour of Abraham Lincoln, in Potomac Park, Washington, D.C., on the axis of the Capitol and the Washington Monument. Finished in 1922, it consists of a marble hall resting on a base of three immense steps. The hall is surrounded by a colonnade bearing the names of the 36 states existing at the time of Lincoln's death in 1865, symbolising his work in preserving the Union. A colossal marble statue inside represents him as the war

president. His second inaugural address is inscribed on the N. wall and his Gettysburg address on the S. The structure of the memorial was designed by Henry Bacon and the statue by D. C. French. See illus. in preceding page.

Lincolnshire. Second largest county of England. For 110 m. it lies along the E. coast, separated from Yorkshire by the Humber and from Norfolk by the Wash. Its area is 2,664½ sq. m., and it is



Lincoln College, Oxford. College front and main entrance in Turl Street

divided into three administrative counties: the parts of Lindsey in the N.; the parts of Kesteven in the S.W., and the parts of Holland in the S.E. The county town is Lincoln, but Grimsby is the largest. Other places are Boston, Horn-castle, Louth, Grantham, Stamford, Gainsborough, and Sleaford. Along the coast are watering-places, Cleethorpes, Skegness, and Mablethorpe among them. Woodhall Spa is an inland watering-place. Some land has been reclaimed from the sea, and much has been drained.

The surface is mostly flat and in places along the coast marshy, some areas being protected from the sea by embankments. In the S.E. are fens forming part of the Bedford Level, and in the N.W. the so-called Isle of Axholme is a fenny

district. In the N.E. are the Wolds, a range of chalk hills extending for 40 m. from Spilsby to Barton-on-Humber. The co. is drained by the Trent, Witham, Welland, and a network of canals and dykes, and is served by main rly. to Scotland.

Lincolnshire is almost wholly an agricultural area, and in Holland claims some of the finest soil in England. It is noted for breeds of cattle, sheep, and horses, while large quantities of wheat, barley, and potatoes are grown. Bulbs come from the Fens. There is fishing; around Scunthorpe a coal and iron-ore field was opened early in the 20th cent. Since 1918 the co. has sent seven members to parliament, one of its divisions including Rutland; Lincoln and Grimsby elect one member each.

The county has a number of fine churches, especially in the S. There are remains of a castle at Bolingbroke in which Henry IV was born. The one at Tattershall has been restored. There were religious houses at Crowland, Kirkstead, etc. Settled by the



Lincolnshire. Map of the second largest county in England, lying between the Humber and the Wash

Anglo-Saxons, Lincolnshire became one of the most Danish parts of England, as is seen by the frequency of *by* in its place-names. Lincoln and Stamford were Danish boroughs, and the county divisions are still known as wapentakes. Retaining its three ancient divisions, it was made a county and in the later Middle Ages was one of the richest parts of England. It has been in the diocese of Lincoln since that place was made a bishopric in 1072. Pop. 624,589.

LITERARY ASSOCIATIONS. These begin with the merging of legend in history, for the poem of Havelok the Dane tells of the founding of Grimsby. Thomas Heywood, an Elizabethan dramatist, described himself as a Lincolnshire man; Mrs. Centlivre, a later dramatist, was born at Holbeach. Boston, which has memorable associations with the Puritans, was the birthplace of John Foxe, who wrote the *Book of Martyrs*, John Conington, and Jean Ingelow. Newton was born at Woolthorpe, and John and Charles Wesley at Epworth. Thomas Cooper, Chartist poet, spent his later years in Lincoln; Bulwer Lytton, who represented Lincoln in parliament, set there the scenes of *A Strange Story*. In the same city stands G. F. Watts's statue of Tennyson, who was born at Somersby, and is commemorated by a bust in the church there. Gainsborough is the S. Ogg's of George Eliot's *The Mill on the Floss*, and Horncastle is the scene of the closing chapters of George Borrow's *Romany Rye*. The *Victoria History of the co.*, ed. W. Page, appeared in 1906.

Lincolnshire, CHARLES ROBERT WYNN-CARRINGTON, MARQUESS OF (1843-1928). British politician. Born May 16, 1843, the son of the 2nd Baron Carrington, he was educated at Eton and Trinity College, Cambridge. In 1865 he became Liberal M.P. for High Wycombe, and went to the lords in 1868 on succeeding to his father's title. In 1885 he was appointed governor of New South Wales. He was lord chamberlain 1892-95; president of the board of agriculture 1905-11; and lord privy seal 1911-12. Created an earl in 1895, he became a marquess in 1912, but on his death, June 13, 1928, this title became extinct.

Lincolnshire Regiment, ROYAL. A regiment of the British army. Raised in 1685 by the earl of Bath as the 10th Foot for service against the Monmouth rebellion, it fought under William III in

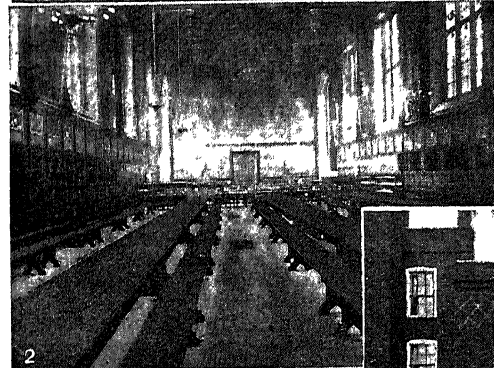
Flanders, distinguishing itself at Steinkirk, and was in all Marlborough's campaigns. In the

Napoleonic wars it gained its Sphinx badge at Alexandria, and it was in the Peninsula under Wellington. In the Sikh war of

1846 the Lincolns led the attack at Sobram, and in the Punjab campaign of 1848-49 participated in the capture of Multan and the battle of Gujarat. During the Indian Mutiny the regiment was at Lucknow. The battle honours Atbara and Khartum were won in the Sudan campaign of 1898, and



Lincolnshire Regiment badge



in the S. African war the regiment was in the operations leading to the capture of Pretoria.

Nineteen battalions of the Lincolns were raised for service in the First Great War, and amongst the battle honours earned were: Mons, Marne, Messines, 1914, '17, '18; Ypres, 1914, '15, '17; Neuve Chapelle; Loos; Somme, 1916, '18; Lys; Hindenburg Line; Suvla. Six battalions in the Second Great War served in

France, 1939-40, Burma, and the liberation of Europe. It was the 4th Lincolns who captured Arnhem on April 15, 1945. In 1946 a special army order authorised the regiment to add the prefix Royal to its title. The depot is at Lincoln.

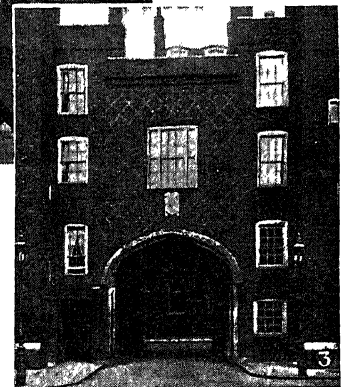
Lincoln's Inn. One of the London inns of court. Originally on the site of Furnival St., owned

by a king's sergeant, by whom it was conveyed in the 14th century to the abbot of Malmesbury, it became an inn of court c. 1312. The society moved into the house of the bishop of Chichester, from whom the present site—between Chancery Lane and Lincoln's Inn Fields—was leased in 1422. This had been the town house of Henry Lacy, 3rd earl of Lincoln. The Old Hall (1489-92) replaced that of the bishop. It was used by the court of chancery in the 18th century, and restored 1924-28. The New Hall (1843-45) includes a library of 75,000 volumes and MSS. To mark the centenary of its opening, Queen Mary, during the Second Great War, elected, *in absentia*, the first woman bencher of any inn of court, planted a walnut tree in the garden.

The chapel, 1623, designed by Inigo Jones, and added to by Lord Grimthorpe, was restored 1927-29. The gatehouse (see illus. below) in Chancery Lane, 1518, bears the arms of Sir Thomas Lovell, and was restored in 1899. John Thurlow lived at 24, Old Buildings,



Lincoln's Inn arms



Lincoln's Inn, London. 1. Library, from the gardens. 2. Interior of the Hall. 3. Gateway, looking towards Chancery Lane

and later at 13, where the Thurlow papers were discovered. Students of the inn included More, Donne, and Oliver Cromwell. Donne delivered the sermon at the opening of the chapel. Members who became prime ministers were Walpole, the younger Pitt, Addington, Perceval, Canning, Melbourne, and Asquith—all barristers. Benjamin Disraeli and Gladstone were students.

The gardens W. of the inn in Lincoln's Inn Fields, a large square laid out by Jones in 1618, and once a duelling ground, were acquired by the L.C.C. in 1895. No. 32, the office of the Land Registry, was the H.Q. of the R.C.A.F. in the Second Great War, and the N. side of the square was officially renamed Canada Walk. Other buildings include the Royal College of Surgeons and Sir John Soane's museum. Although German bombs in the Second Great War (and in the First) caused considerable destruction in the immediate vicinity, Lincoln's Inn was more fortunate than Gray's Inn or the Temple in escaping major damage. See Inns of Court. *Consult* Short History, Sir G. Hurst, 1946.

Linctus. Medical preparation to stop a hacking cough. It contains honey or treacle, possibly reinforced by heroin or codein to dull the cough reflexes in the brain. In due course the mucous membranes secrete freely and render expectoration easy.

Lind, JAMES (1716-94). Scottish physician. He took his degree at Edinburgh and as physician to the Royal Naval Hospital at Haslar, 1758-83, made a study of typhus, and suggested the use of lemon and orange juice by which scurvy was eventually eradicated from the navy. He suggested the use of hospital ships for sick sailors in tropical ports, and arranged for the distillation of sea water for drinking purposes. Author of a Treatise of the Scurvy, 1753, he died at Gosport, July 13, 1794.

Lind, JENNY (1820-87). Swedish singer. Johanna Maria Lind was born in Stockholm, Oct. 6, 1820, and as a child appeared on the stage, making her operatic debut in 1836. She attained great success as an actress, was admitted to the Swedish academy of music in 1839, and appointed court singer. After studying with Garcia in Paris until 1841, she appeared at the leading European opera houses—at The Haymarket, London, in Robert the Devil, 1847. In 1849 she abandoned the stage



Jenny Lind, Swedish singer, traditionally the world's greatest soprano

for the concert platform, and toured the U.S.A. under the management of Barnum. There she married Otto Goldschmidt (1829-1907), director of the Bach choir. She spent the rest of her life in England, became chief professor at the R.C.M. in 1883, and died at her home at Malvern Link, Nov. 2, 1887. Her gifts to charity exceeded £30,000. The "Swedish nightingale" was possibly the world's greatest soprano, her voice being seldom equalled for range, texture, brilliance, or control. *Consult* Lives, H. S. Scott-Holland and W. S. Rockstro, 1891; Mrs. R. Maude (daughter), 1926.

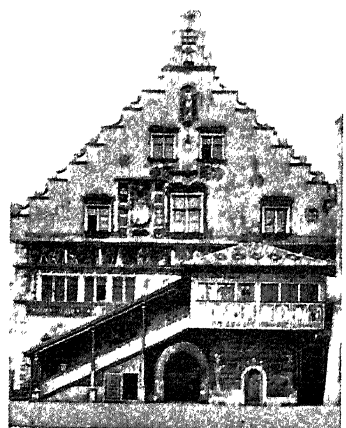
Lind-af-Hageby, EMELE AUGUSTA LOUISE (b. 1878). Anglo-Swedish humanitarian. Born in Sweden, Sept. 20, 1878, she was educated there and in England, where she settled in 1896, becoming naturalised in 1912. Early associated with the feminist movement, she was also a strong opponent of vivisection, founding a British and an international society and a journal devoted to animal protection. During the First Great War she worked for wounded horses, receiving the silver medal of the French ministry of agriculture. President of the international humanitarian bureau of Geneva, founded 1928, she promoted the evacuation of animals at the outbreak of the Second Great War.

Lindau. Town of Württemberg-Hohenzollern, W. Germany. On an island in Lake Constance, it is linked with the N.E. shore by two bridges of 240 and 450 yds. respectively, the latter a rly. dam linking up with the steamship and seaplane port. The picturesque old town, surrounded by suburbs and a spa, Schachen, is a cele-

brated health resort with normally more than 100,000 visitors every year. It arose from a Roman castle, had a 9th century convent, was made a free city of the Empire in 1274, joined the Schmalkalden League (q.v.) and was taken by Imperial forces, and fell to Bavaria in 1806. Among its remarkable buildings are S. Stephen's church (1180), S. Peter's (c. 900), and a Renaissance town hall. Pop. 13,950.

Lindau, PAUL (1839-1919). A German dramatist. Born at Magdeburg, June 3, 1839, he was educated at Halle, Leipzig, and Berlin. In Paris he became a newspaper correspondent, afterwards doing journalistic work at Düsseldorf and Elberfeld and for the Wolff Bureau. He founded two magazines, Die Gegenwart, 1872, and Nord und Süd, 1877. In 1895 he became connected with the court theatre at Meiningen, and was afterwards manager of theatres in Berlin. Lindau made his name as a dramatist in 1868 with his play Marion; others were Maria und Magdalena, Die Erste (the first), Der Abend (the evening). He died Jan. 31, 1919.

Lindbergh, CHARLES AUGUSTUS (b. 1902). American airman. Of Swedish descent, he was born at Little Falls, Minn., Feb. 4, 1902. Having been an air-mail pilot, on May 20-21, 1927, he attracted world attention by making the first solo flight from New York to Paris, non-stop, in a single-engined Ryan monoplane, covering 3,600 m. in 33½ hrs. He was enthusiastically received in Paris and later in London, and on his return to America was hailed as a national hero. Other notable flights in-



Lindau, Germany. German Renaissance Town Hall, as it was restored, 1885-87

cluded a tour of Europe in 1933, in which he crossed both N. and S. Atlantic. After the kidnapping of his baby son in 1932 (*v.i.*) Lindbergh settled in England, but after visits to Germany and Russia, he returned to the U.S.A., where from the earliest days of the



Charles A. Lindbergh,
American aviator

Second Great War he became an outspoken isolationist, sympathetic towards Germany, and believing in German victory. In 1941 his attitude was strongly criticised by President Roosevelt, and he was obliged to relinquish his colonelcy in the U.S. army. His autobiography, *We—Pilot and Plane*, appeared in 1927. Lindbergh's wife, formerly Anne Morrow (m. 1929), wrote *North to the Orient*, 1935; *Listen! The Wind*, 1938, on their joint flying experiences, which included a survey of Greenland in 1933.

Lindbergh Baby Case. American kidnapping, murder, investigations, and trial. On March 1, 1932, Charles Augustus, 19-months-old son of Charles Lindbergh (*v.s.*), at that time a national hero, was kidnapped from his home at Hopewell, N.J. The kidnapper gained entry by a home-made ladder and left a note demanding a ransom of £10,000. A nation-wide hunt was organized for the criminal. Gangsters and other known offenders were quick to deny any knowledge of the crime, and Al Capone (*q.v.*), then serving a prison sentence, offered £2,000 to anyone producing the child. On April 2 Lindbergh paid through an intermediary, Dr. Jafsic Condon, the ransom money to an individual who claimed to be able to return the child. The meeting took place at midnight in the Bronx cemetery, N.Y.C.; the negotiations took place across a hedge. No child was produced, and on May 12 the baby's body, reduced almost to a skeleton, was found in a thicket within 5 m. of the Lindbergh home.

Scores of arrests were made and hundreds of suspects held for questioning. The New Jersey police methods came in for much adverse criticism, particularly after an English maid employed by Mrs. Lindbergh's mother committed suicide following police examination. The police later admitted

there had been no case against the girl. In 1933 a man who received money from Lindbergh for declaring that the body was not that of the child, and that he could produce the child, was sentenced to imprisonment for obtaining money by false pretences. Another confessed to the murder, but later retracted, declaring that detectives had tortured him into confession. The detectives concerned were later arrested. Meanwhile, state and federal police, collecting clues, gradually obtained a composite picture of the probable occupation, habits, and appearance of the unknown murderer, and were even able to have a sketch drawn of him. They then awaited the cashing and identification of banknotes or gold certificates (*i.e.* certificates given in exchange for gold dollars when these were called in in 1933) paid by Lindbergh as ransom.

In Jan., 1934, a motorist paid for petrol at a Bronx filling station with a gold certificate. The garage attendant, suspecting the certificate might be a forgery, wrote the car's number on the back of the note. The bank passed the certificate to the police, who identified it as part of the ransom money. The car number led them to Bruno Hauptmann, 35-year-old German-born carpenter, who had served terms of imprisonment in Germany. A clue already held was a piece of wood which had repaired a rung of the kidnapper's ladder. It was traced back to the forest from which it had been cut and thence to a timber works where Hauptmann had been employed. Search of Hauptmann's garage revealed Dr. Condon's telephone no. written on a rafter, while beneath the building was £3,000 of the ransom money. In Hauptmann's possession was a notebook containing a sketch of the ladder and writing identical with that on the note demanding ransom.

Hauptmann was arrested and, on Oct. 9, charged with murder. At his trial, which opened on Jan. 2, 1935, Lindbergh swore to his voice being that of the man to whom the ransom had been paid, while a number of witnesses testified to his having been seen in the vicinity of the Lindbergh home several times before the kidnapping. On Feb. 2 he was found guilty of murder and sentenced to death. After a number of appeals and stays of execution, he was electrocuted at the New Jersey state penitentiary, April 3, 1936.

Hauptmann made no confession and no evidence could be submitted proving the specific manner of the child's death, but it was generally believed that death was accidental, the baby having been dropped while the kidnapper was descending the ladder. It was also suspected, but never proved, that Hauptmann's only accomplice was a member of the Lindbergh household. The lawyer defending Hauptmann became insane. After this case kidnapping was made a federal instead of a state offence. The cost of the trial to New Jersey, £200,000, was a record.

Linden. German word for limes. It is best known as the name of the avenue in Berlin once flanked with lime trees and called Unter den Linden. See Berlin.

Lindfield. Village of Sussex, England, 2 m. N.E. of Hayward's Heath. Notable for its fine Tudor houses and church dating from the 14th century, it contains buildings erected as schools by William Aller in 1825.

Lindgren, WALDEMAR (1860–1939). Swedish-American geologist. Born at Kalmar, he went to America in 1883 after finishing his scientific education at Freiburg. With the U.S. geological survey for 27 years, he published many classic reports. He was professor from 1912 at Massachusetts institute of technology, retiring at 73. One of the founders of modern mining geology, Lindgren's major contributions were in the field of ore genesis. He was largely responsible for the conception of metasomatism in vein formation and for the most useful classification of ore deposits. The final application of his ideas was published in his *Mineral Deposits*, the most comprehensive text-book of its kind, completed 1933. He died Nov. 3, 1939.

Lindi. Town and harbour in Tanganyika Territory. It is about 80 m. N.W. of Cape Delgado. There is a good, safe anchorage, and ivory, sorghum, sesame, and beeswax are exported. The administrative division of Lindi is the most southerly in the country and extends from the coast to Lake Nyasa.

Lindisfarne. Ancient and alternative name of Holy Island, Northumberland. A priory was founded here in Anglo-Saxon times, and the remains of its Norman church still stand. In 1715 two Jacobites attempted to hold the island for the Pretender. See Holy Island. Consult A Naturalist on Lindisfarne, R. Perry, 1946.

Lindisfarne Gospels. Finest extant Early English illuminated MS. of the Gospels. Produced in honour of S. Cuthbert in the 7th century by Eadfrith, Bishop of Lindisfarne (Holy Is.), it was bound by Aethilwold. While exhibiting Byzantine influence it is an example of Anglo-Celtic illumination at its best. An interlinear gloss by Aldred is the earliest known English translation of the Gospels. The MS. is in the British Museum.

Lindley, JOHN (1799–1865). A British botanist and horticulturist. Born near Norwich, Feb. 5, 1799, he was educated at its grammar school. In 1821 he was employed by the Royal Horticultural Society to superintend the laying out of their new garden at Chiswick, and this led to his becoming secretary. In 1829 he published a Synopsis of the British Flora, and in 1830 an Introduction to the Natural System of Botany. Lindley was appointed professor of botany in University College, London, in 1829, and to the Apothecaries' Company in 1835. The most important of his works is *The Vegetable Kingdom*, 1846. He edited *The Botanical Register* for 19 years, and *The Gardeners' Chronicle*, founded by him in 1841, for 25 years. He died Nov. 1, 1865.



John Lindley,
British botanist

His son Nathaniel (1828–1921), Baron Lindsay, was a lawyer who made his name by writing standard works on the law of partnerships and the law of companies. Made Q.C. in 1872, a judge in 1875, and master of the rolls in 1897, he was a lord of appeal from 1900 to 1905.

Lindrum, WALTER (b. 1899). Australian billiards player. A left-hander, he made a four-figure break when 17, and having proved his supremacy at home, came to England, 1931, and in London, 1932, he made the world's highest break of 4,173, becoming professional champion in the following year. Lindrum scored 1,000 in 34 minutes in 1934. After the baulk-line rule had been



Walter Lindrum,
Australian billiards
player

amended, Lindrum went on raising the record for a break until in a charity match at Melbourne, Nov., 1944, he achieved 3,737 and 3,752 in successive breaks.

His nephew Horace Lindrum (b. Jan. 19, 1912) won the Australian professional snooker championship, 1931, and was runner-up in the world's professional snooker championship, London, 1946. By 1948 he had made over 200 snooker centuries, and 15 breaks of over 1,000, the highest being 1,431.

Lindsay. A town of Ontario, Canada. It stands on the Scugog river, in Victoria co., 69 m. N.E. of Toronto, and is served by the C.P.R. and C.N.R. The industries include flour and saw milling, and the manufacture of agricultural implements; also a trade in lumber. Pop. 8,403.

Lindsay, EARL OF. Scottish title held by the family of Bethune. In 1445 Sir John Lindsay, justiciar of N. Scotland, was created Baron Lindsay of the Byres. His descendant John, 10th baron (1596–1676), was created earl in 1633. He fought with distinction at Marston Moor, took part in the attempt to rescue Charles I from Carisbrooke, assisted in the Restoration, and was made lord treasurer in 1661. He became 17th earl of Crawford in 1644, and five of his successors bore both titles, but the direct line failing in 1808, the Lindsay earldom, to be distinguished from that of Lindsey, went to the 16th Baron Lindsay of the Byres, and the 6th earl of Balcarres became 23rd earl of Crawford. The name of Bethune was first assumed in 1779. The 14th earl, William Tucker Lindsay-Bethune (b. 1901), succeeded his father in 1943. His son and heir is Viscount Garnock.

Lindsay, ALEXANDER DUNLOP LINDSAY, 1ST BARON (b. 1879). A British philosopher. He was educated at Glasgow university and University College, Oxford. At first Shaw fellow at Edinburgh, he became lecturer in philosophy at Victoria university. A fellow of Balliol, Oxford, and classical tutor from 1906, he was chosen master of the college in 1924, after holding for two years the chair of moral philosophy at Glasgow. He retired 1949. Vice-chancellor of Oxford, 1935–38, he received a peerage in 1946.



1st Baron Lindsay,
British philosopher

His great work was his translation of the Republic of Plato, acclaimed as the most felicitous and accurate of all that have appeared. Later works included a study of the philosophy of Bergson; an edition of Marx's Capital, 1925; *Essentials of Democracy*, 1929; *The Moral Teaching of Jesus*, 1937; *The Modern Democratic State*, 1943; *The Good and the Clever*, 1945.

Lindsay, JAMES BOWMAN (1799–1862). Scottish scientist. Born at Carmyllie, Angus, Sept. 8, 1799, he became a weaver, contributing by his trade to graduate at St. Andrews. He devoted his attention especially to mathematics, in which subject he became a lecturer in the Watts Institution, Dundee, 1829. He early perceived the possibilities of electricity, experimented in telegraphy, and in 1854 patented a scheme of wireless telegraphy to America, in which the sea was to be used as a conductor. He also made experiments with electric light. Interested in philology, he spent 25 years compiling a dictionary in 50 languages. He died June 29, 1862.

Lindsay, NICHOLAS VACHEL (1879–1931). American poet. Born at Springfield, Ill., Nov. 10, 1879, he became a well-known lecturer, but for long periods lived as a vagabond, his experiences forming the basis of many poems. General William Booth Enters into Heaven, 1913, was the best known. He published *The Chinese Nightingale*, 1917; *The Golden Whales of California*, 1920. Going to the Sun, 1923, and Going to the Stars, 1926, were both illustrated by himself. He died Dec. 5, 1931.

Lindsay, NORMAN ALFRED WILLIAM (b. 1879). An Australian artist and writer. Born at Creswick, Victoria, Feb. 23, 1879, he joined the Sydney Bulletin in 1901, and was its chief cartoonist for many years. His erotic illustrations (in line and wash) of Theocritus, Petronius, Boccaccio, and Casanova, were well known, and a selection of his drawings was published 1924. His other books include *A Curate in Bohemia*; *The Cautious Amorist*, Pan in the Parlour, Age of Consent (fiction, illustrated by himself); and *Creative Effort* (essays).

His son, Jack Lindsay (b. 1900), was a poet and novelist, whose works included translations of Petronius and Catullus.

Lindsay, ROBERT (c. 1530–90). A Scottish historian, born near Pitscottie, Fife. He is known

solely for his History and Chronicles of Scotland, which continued the work of Hector Boece from 1437 to 1565, and was then carried forward by another. Inaccurate as it is, the history has a value owing to its picturesque representation of the period with which it deals. It has been edited by A. J. G. Mackay, 1899–1911. Written in the vernacular, not in Latin, as was the work of Boece, it was used by Scott for Marmion.

Lindsay, SIR RONALD CHARLES (1877–1945). British diplomatist. Born May 3, 1877, fifth son of the 26th Earl of Crawford, he went to Winchester, and in 1899 he entered the diplomatic service. Junior posts in European capitals gave him enough experience to be secretary to Grey, 1908–09, and throughout the First Great War he was under-secretary for finance in the Egyptian government. He was minister plenipotentiary in Paris, 1920–21, returning for duty at the foreign office until 1924. His first appointment as ambassador was in 1925 at Istanbul, whence he went to Berlin, 1926–28. After a further period as under-secretary in the Foreign office, he was appointed minister to Washington in 1930, and remained until replaced by Lord Lothian in 1939, when he retired. Lindsay, who was knighted in 1925, died Aug. 21, 1945.

Lindsey. One of three parts into which Lincolnshire is divided. The N. part of the co., it covers 1,520 sq. m., and is more than half the whole. Being an administrative co., it has its own council. For electoral purposes it has four co. constituencies—Brigg, Gainsborough, Horncastle, and Louth. Chief town, Lincoln. Pop. 422,199. See Holland; Kesteven; Lincolnshire.

Lindsey, EARL OF. British title borne since 1626 by the family of Bertie. Robert Bertie, Lord Wil-

oughby de Eresby, head of a Lincolnshire family and lord high admiral, was made an earl in 1626. A Royalist, he was killed at Edgehill in 1642. Robert, 4th earl (1660–

of the 2nd earl, who became the 9th earl, and from him is descended Montague, 13th earl, who was born Nov. 2, 1887, and succeeded a kinsman in 1938. He is also 8th earl of Abingdon. The earl's seat is Uffington House, Stamford, but many of the estates have passed elsewhere. The name Bertie is pronounced Barty.

Line. In mathematics, a magnitude of one dimension only, length, and thus the path of a moving point. A line may be curved or straight, or consist of a combination of the two. A straight line may be defined as the shortest distance between two points, or to be such that when rotated about any two points in it it does not change its position. See Geometry.

Line. In military parlance, an arrangement of troops by which their frontage is relatively great as compared with their depth. It is thus the opposite of a column. A file of soldiers, i.e. a front rank man and his rear rank man, occupies a lateral space of 27 ins.; thus a company of 200 rank-and-file (100 files) would require a frontage of 75 yds. At the battle of the Alma the whole of two divisions were thus employed, and the line was 2,400 yds. in length. Such a formation cannot be manoeuvred, though its fire effect is great. With the development of rifles and automatic weapons, troops ceased to fight in line, and now are normally dispersed in open order under cover. An arrangement of columns side by side is called a line of columns or, if each column is of considerable density, a line of masses. The term is loosely used in other senses, e.g., first line, front line, line of entrenchments. See Infantry; Tactics.

Line. In drawing, line is the representation of form by lines on paper or other material. The term line drawing is used in contradistinction to wash drawing, wherein the image is rendered by means of flat washes or tones. Occasionally the two methods are combined in the same drawing, the lines reinforcing the demarcation of different parts of the picture or emphasising a particular tone.

Line in drawing also has its own inherent quality, which varies in accordance with the skill or feeling of the draughtsman. Thus it may attain its end by being expressive in the manner of a Phil May sketch, where economy, i.e. the elimination of all superfluous lines, is sought for; or in the manner of

an Aubrey Beardsley drawing, where it is used not merely with economy, but with the aim of giving an additional beauty to a beautiful design. In the latter case the artist's use of line becomes the distinguishing feature of his drawing, being that which is mainly instrumental in conveying to the spectator the aesthetic emotion of the artist. Even a painter, e.g. Botticelli, may be praised for his fine "sense of line."

Line engraving is a style of engraving in which the effect is produced by combinations of lines, cut into copper or steel by the graver, or the dry point, or incision combined with etching. In process engraving, a line block, as on p. 5140 (top), is distinguished from a half-tone block, e.g., that used in the first column of this page. See Drawing; Engraving.

Línea de la Concepción, LA. Town of Spain, in the prov. of Cadiz. It lies 1½ m. N. of Gibraltar, adjoining the neutral ground and within the Spanish lines. It is the frontier post and headquarters of the commandant in charge of the Spanish lines. Here are a theatre, a casino, and a bull-ring. La Línea is inhabited chiefly by labourers and returned convicts, and does a large trade with Gibraltar in vegetables, fruit, etc.

Linen (Lat. *linum*, flax). Flax fibre in a manufactured form. The plant grows in any climate, but preferably in temperate countries and dry loam soils, and is the same as that which bears linseed. The fibre is derived from the stalks, and forms the bast beneath the bark. Flax grown for fibre is not allowed to seed fully, but is pulled from the ground and laid out to dry. The immature seed is removed by rippling, or drawing the stalks through a comb.

The fibre is recovered by retting, a putrefactive operation in course of which bacteria weaken the strong resin which binds the fibre to the straw. In Ireland the process of retting consists in immersing the dried stalks in ponds made for the purpose. The flax is weighted down with straw, sods, and stones, to keep it submerged. In Belgium flax is retted by sinking it in weighted crates in rivers. Russian dew-retted flax is treated by spreading on grass and allowing atmospheric moisture to act; the result is more uneven retting and sometimes a discoloured fibre.

Belgian (Courtrai) retted flax has always been considered the



1st Earl of Lindsey, English sailor after Van Dyck

1723), was made marquess of Lindsey and duke of Ancaster, but these titles became extinct when the 5th duke died in 1809. The earldom passed to a descendant

best, owing to some peculiarity in the river water.

Retted flax passes from the fields to the flax or scutch mills. The stems are passed through fluted rollers which break, and thus facilitate the removal of the straw, or boon. The broken and brittle woody matter is removed in the main by the operation of scutching, *i.e.* beating by means of swiftly revolving wooden beaters. The secondary operation, finishing, is a further scutching for complete removal of the woody matter. The clean fibre is tied into stricks, or bundles, of which 5 to 8 make one stone (14 lb.). This is raw flax ready for market and conversion into linen yarn.

Method of Spinning

In the flax-spinning mill "roughers" divide, straighten, and comb out the fibre in a preparatory way over a tool having long, sharp pins. The best flax consists of middles formed by removing the root and tip ends of fibre. The fibre must usually be cut to a manageable length, and it is then hackled, a process which, in effect although not in detail, corresponds to the combing of wool. In the course of hackling the short fibre, or tow, is removed from the long, or line, and the fibres are laid parallel. Tow makes an inferior yarn, much used for weaving towelling. Line serves a variety of purposes according to the quality. That suitable for fine purposes is made into handkerchiefs, lawns, cambrics, fine damask, and thread for lace-making. Coarser qualities are made into the heavier sheetings and the cheaper damask tablecloths and napery. The coarsest is used for tailors' padings and buckram, holland, etc. There are uses for all classes of linen yarn, and bootmakers, saddlers, carpet manufacturers, fishing-net makers, sail makers, tent makers, and aeroplane riggers all use linen thread.

Hackled flax in the form of a fringe of fibre is pieced together into a continuous ribbon or sliver in the operation known as spreading. The twistless rope of fibre so formed is attenuated and regularised by methods closely corresponding to those for spinning worsted yarn. According to the purpose and the proposed fineness of the yarn, it is drawn and doubled, and eventually turned out in the form of a roving, ready for the spinning-frame.

All except the heaviest linen yarns are wet-spun; *i.e.* they are passed through hot water to soften

the glutinous matter still present in the flax and so make possible production of a more regular yarn. They are spun from the roving on to bobbins by means of flyer-frames, and the fineness of yarn is denoted by leas or cuts, measuring 300 yds. Twelve leas form a hank of linen or thread, and 16½ hanks form a bundle—60,000 yds.

The yarns are for the most part woven into cloth of the kinds already mentioned, and the weaving is done upon looms of identically the same principle as are used for fabrics made of other fibre. The several parts of the loom are proportioned to the width, weight, and complexity of the fabrics.

Linen has a strong competitor in cotton, which can be both grown and manufactured with less expenditure on labour and capital, and to this fact is due the relative smallness of the linen industry of the world. Linen is distinguishable from cotton by a variety of means. The most certain is by noting the relative lengths of the fibres; linen—varying with the completeness of the division of the original fibre—is long, whereas cotton is short. Woven-linen goods are colder to the touch than cotton, hence a common aversion from linen bed-sheets. On the other hand, linen is more durable than cotton and less disposed to shed short fibre or lint in course of wear. Tearing less easily than cotton, it is preferred for canvas used for waterproof wagon covers and tarpaulins, as well as for sailcloth.

One of the Oldest Textiles

Linen is one of the oldest known textiles. Among the ancient Egyptians it was used for clothing, mummy-wrapping, etc., and, being a symbol of purity, was the only material that the priests were allowed to wear. The famous praying tapestry is woven of linen. In England, Scotland, and Ireland the linen trade was fostered by special laws, by periodical immigrations of Flemish weavers, and by the incorporation in 1746 of the British Linen Company, which originally manufactured linen, but limited its operations from 1763 to banking. The invention of cotton spinning and weaving machinery towards the end of the 18th century was a severe blow to the linen trade, which was mainly a domestic industry; but the making of linen gradually tended to become specialised in certain localities, and with the advent of machinery, pioneered by Kendrew and Porthouse of Darlington in 1787, became a thriving industry.

The original cotton fabrics made in the U.K. all had a linen warp, and today there is a large sale of union linens made half of cotton, half of linen. Linen is made preponderantly in N. Ireland, with Belfast as the centre. Scotland stands next in the industry of the U.K., Dunfermline being celebrated for its heavy and hard-wearing linens and damasks. In England hardly any line, as distinct from tow, is spun, and the chief centre of the industry in woven goods is Barnsley, where linen drills are produced, chiefly for men's wear in the tropics. *See* Flax; Loom; Spinning; Weaving; *consult* The Manufacture of Linen, Hemp, and Jute Fabrics, H. R. Carter, 1909; Jute and Linen Weaving, T. Woodhouse and T. Milne, 2nd ed. 1914.

Line of Battle. Fighting formation of a fleet as formerly laid down by regulation. The ships of the fleet used to sail in line ahead, and in this formation engage the enemy when his ships were brought parallel to the line. From this custom came the term "line of battle ship"—shortened into battleship—in contradistinction to other craft, such as cruisers, that were not powerful enough to lie in the line. Line of battle was formed at Jutland, but nowadays the formation in which a fleet engages is decided by the admiral commanding. The equivalent term for the fighting formation of an army or division is order of battle.

Line of Departure. Term in ballistics to describe the imaginary straight line representing the centre of gravity of a projectile at the instant it leaves the muzzle of a firearm. The line coincides with the axis of the barrel as the projectile leaves the muzzle. As a firearm "jumps" when fired, the axis of the barrel is slightly curved, and so strictly the line of departure is a continuation of the axis of the barrel at the tip of the muzzle.

Line of Force. Term used in describing electric and magnetic fields. It can be defined as a curve such that its tangent at any point gives the direction of the intensity of the force which is acting. By convention, a line of force always starts on a positive charge, or in magnetism on a north-seeking pole and ends on a negative charge or south-seeking pole. A line of force therefore can also be described as the path which would be taken by a positive charge (or a north pole) in an electric (or magnetic) field. The pattern of the lines of force in the

magnetic field around a magnet can be demonstrated by placing above the magnet a sheet of stiff paper and sprinkling iron filings on it. With gentle tapping the filings will arrange themselves in the appropriate pattern. The strength of the field can be represented by the number of lines of force passing through unit area. *See Electricity; Magnetism.*

Line of Life. In palmistry, the name given to the line on the palm of the hand surrounding the ball of the thumb. It is held by palmists to indicate by its length the probable duration of life, and by its breaks and branches the occurrence of illness or accident prejudicial to life. *See Palmistry.*

Line of Sight. Term in ballistics to describe an imaginary line passing from the marksman's eye through the back- and fore-sights of a firearm to the target.

Liner. Originally name of a large passenger ship which followed a direct line or route and called at fixed ports of call. Such vessels are mostly employed on the Atlantic and other oceanic passages, and belong to famous lines like Cunard-White Star, Royal Mail Steam Packet, Peninsular and Oriental, etc. The term is now also used for cargo vessels sailing to a scheduled time-table between fixed ports of call, as distinct from the tramp steamer operating according to availability of cargo.

Line Regiments. General term applied to all infantry and cavalry regiments of the British army except the Foot Guards, Rifle Brigade, Life Guards, and Royal Horse Guards. It is a survival of the period when regiments were numbered and formed the line of garrison at home and overseas, as distinct from household troops, which are in attendance on the sovereign.

Lines of Communication. Military term denoting the system of communication, whether by road, rail, air, or water, between an army and its base or bases, together with the district through which they pass, the limits being defined by the commander-in-chief. The defence of such lines is in the hands of troops specially detailed for the work, the district being placed under martial law. The administration of lines of communication belongs to the inspector-general of communications.

The mobile nature of the campaigns of the Second Great War entailed extremely long lines of communication, the maintenance and defence of which created

pressing problems. A notable example occurred during the drive of the 8th army towards Tunisia. During the Allied campaigns of 1944-45 in Europe, armour sometimes outran the lines of communication, necessitating a slowing down of the advance. Communications in Burma were often entirely dependent on air transport. *See Logistics; Supply; Transport.*

Line Standard. Standard of length maintained on a metal bar. Near each end of the bar a gold plug is inserted, and on the flat top of the plug two fine hair-lines cross at right angles. The standard length is the distance between two pairs of intersecting hair-lines measured under specific conditions. Important points in the design of a line standard are the material of which the bar is made, the manner in which it is supported, and the fineness of the hair-lines. The most satisfactory material is platinum-iridium alloy. The bar should be supported on knife-edges or rollers so placed as to give the minimum distortion through bending. The hair-lines should be ruled with a dividing engine using a diamond point. An international prototype metre, kept in Paris, is a platinum-iridium polished bar, supported at two points 22.5 cm. from each end, the metre being defined as the distance at 0°C. between the intersections of the two pairs of hair-lines. The British Imperial standard yard is of platinum alloy supported at eight points 4.79 ins. apart. Experiments have been made to establish a standard of length based on the wavelength of light, which is unvarying. *See Metric System; Weights and Measures.*

Ling (*Calluna vulgaris*). An alternative name for heather (*q.v.*). *See Ericaceae.*

Ling (*Molva molva*). A fish allied to the cod, found in the seas of N. Europe. It is more closely



Ling. Specimen of the N. European fish

related to the burbot or eel-pout (*q.v.*), varies from four to six feet in length, and in colour is grey or black on the back, and greyish white below. It feeds upon smaller fishes, and is extremely prolific, the female producing from 12 to 30 million eggs in the season. It is an important food fish for S. Europe, chiefly eaten dry cured. The oil

from its liver is a common adulterant of cod liver oil.

Lingah OR BANDAR LINGAH. Port on the E. side of the Persian Gulf. It is in the province of Laristan, Persia, and lies about 100 m. S.W. of Bandar Abbas. It has an extensive trade in pearls, cotton, and rice.

Lingard, JOHN (1771-1851). British historian. Born of humble parents at Winchester, Feb. 5, 1771, Lingard was educated at Douai, was ordained in 1795, and became a member of the teaching staff at Crook Hall, Durham, remaining



with the institution there and at Ushaw until 1811. The rest of his life was passed at Hornby, Lancs, where he died July 17, 1851. Lingard's fame rests entirely on his History of England, the one work of its kind written by an English R.C. It appeared in eight volumes, 1819-30, and several editions followed; it was translated into French, German, and Italian. It narrates the history of England from the earliest times to 1688, and has been praised for moderation and accuracy, though lacking style. A continuation was written by Hilaire Belloc.

Lingayat. A religious community in S. India. Numbering about 5,000,000, they are Kanarase speaking Siva-worshippers who wear, suspended by a neck-string, silver boxes containing Siva's emblem, a stone or metal linga or phallus. They call themselves Vira-Saivas, and their itinerant priests jangamas. Owing to the refusal of the aboriginal folk to submit to the caste distinctions imposed by the Aryan ascendancy, they denied Brahman pretensions, avoided cremation and child-marriage, and permitted the marriage of widows. The reformation received an impetus in the 12th century from two Brahman devotees, Ramayya and Basava.

Under the pressure of social barriers, this casteless system has now become a group of castes professing a common faith. They are classified into (1) pure, comprising the priests and the leading traders; (2) affiliated, comprising 70 functional groups such as weavers and oil-pressers, who at various times have been admitted to the com-

munity and initiated into the eightfold sacrament. These two classes deny the equality with them of a third group, comprising washermen, shoemakers, and other castes regarded as unclean by Brahmans. *See* Caste.

Lingayén. A town of Luzon, Philippine Islands. The capital of the prov. of Pangasinán, it stands at the head of the Gulf of Lingayén on an island in the Agno river delta, 105 m. N.N.W. of Manila. It has a fine church and trades in rice, fish, and a wine called nipa. Pop. 23,000. The Gulf of Lingayén, on the W. side of Luzon, penetrates inland for 30 m. and is 20 m. wide at the mouth. In the Second Great War it was the scene of Japanese landings Dec. 22, 1941, and of U.S. landings Jan. 9, 1945. *See* Pacific War.

Lingfield. Village of Surrey, England. It is 10 m. S.E. of Reigate, with a rly. station. The river Eden flows past into Kent. The fine collegiate church of SS. Peter and Paul was rebuilt by Lord Cobham in the 15th century; it has interesting brasses and other memorials. The village has many associations with the great family of Cobham, who lived at Sterborough Castle, 2 m. away. In the 15th century Lord Cobham founded here a college for poor persons, but this has disappeared. Lingfield has a cage, or prison, now used as a museum. Frequent meetings are held on its racecourse. Pop. 5,214.

Linggi. River of the Malay Peninsula. It separates Malacca from Negri Sembilan.

Lingua Franca (Ital., Frankish tongue). Corrupt form of Italian. It contains an admixture of Arabic, Greek, Turkish, etc., and serves as a means of communication between Europeans and the peoples of the Levant. It originated in the time of the maritime supremacy of Genoa and Venice when all Europeans were known to Orientals as Franks.

Linguetta. Cape of Albania. The termination of the Acroceranian or Ceraunian Mountains, and also known as Cape Glossa, it juts northward and forms the side of the Gulf of Avlona or Valona. It is the ancient Cape Acrocerania.

Lingula Flags. In geology, name given to strata belonging to the Upper Cambrian formation. They occur extensively in Wales. *See* Cambrian.

Liniers, SANTIAGO DE (1756-1810). Spanish sailor. By birth a Frenchman, he was born at Niort,



Santiago de Liniers, Spanish sailor

in 1806. In 1807 he defended Buenos Aires, his reward being the office of governor of the prov. He supported the Spanish king Ferdinand VII against Joseph Bonaparte. During a rising against the Spanish power he was captured and executed at Córdoba de Tucumán in Argentina, Aug. 26, 1810.

Liniment. Application intended to be rubbed into the skin, containing chemical substances in an oily or spirituous base. As liniments are often highly poisonous, they must be dispensed in special bottles to distinguish them from medicines. They may relieve pain, as in rheumatism; act as counter-irritants, as in cases of lung congestion; or soothe, as in skin complaints.

Link. Torch made of tow dipped in pitch. Before the illumination of the streets links were used for lighting pedestrians on their way. Occasionally, attached to the railings in front of old houses may still be seen the funnel-shaped extinguishers used to put out the lights. Link boys were men or boys who, for a fee, carried links to guide persons, whether walking or driving, on their way.

Link. Measure of length. The hundredth part of a chain, it measures 7·92 ins. *See* Gunter's Chain.

Link, THE. Organization founded by Adm. Sir B. Domville in 1936 to promote close relations between Britain and Nazi Germany. It was dissolved on the outbreak of the Second Great War, and Adm. Domville was later detained under defence regulation 18b. It published a journal, *The Anglo-German Review*, the circulation of which never exceeded 400.

Linkage. In genetics, it is found that genes situated in the

July 28, 1756, and named Jacques Antoine Marie Deliniers-Brémont. He became an officer in the Spanish navy and served against the British in South America

same chromosome at the beginning of meiosis (*q.v.*) tend to remain together in an observable proportion of cases. The percentage of occasions on which such genes do keep together is called their linkage value, and is thus the reciprocal of the crossing-over value, which measures the percentage of occasions on which they become separated. This principle is used in making chromosome maps.

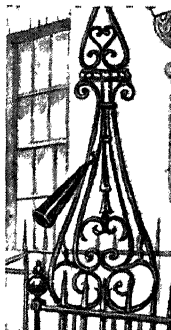
Linkages. In mechanics, a system of links pivoted together to describe parallel motion. Such a system was used by Watt in beam engines to connect the head of the piston-rod, which moved up and down in an approximate straight line, with the end of the beam which described the arc of a circle. The Peaucellier cell, so called after its inventor, consists of seven links and gives exact straight line motion. Kempe's angle trisector is another important linkage.

Linklater, ERIC (b. 1899). Scottish writer. Born at Dounby, Orkney, he was educated at Aberdeen grammar school and university, of which he became rector in 1945. He was assistant editor, *Times of India*, 1925-27. He came forward as a satirist with *Poet's Pub*, 1929 (filmed 1949), and followed it with stories notable for robust humour, *e.g.* *Juan in America*, 1931; *Magnus Merriman*, 1933; *Ripeness is All*, 1935; *The Man on My Back*, 1941; *Private Angelo*, 1946 (filmed 1949); *Sealskin Trousers*, 1947. He was director of public relations at the war office, 1941-45. For radio he wrote programmes like *The Cornerstones*; *Socrates Asks Why*; *Rabelais Replies*; *The Great Ship*. His stage plays were *Crisis in Heaven*, 1944; *Love in Albania*, 1949. He contributed the article on Sir Walter Scott in this *Encyclopedia*.



Eric Linklater, Scottish writer

Link Motion Valve Gear. Mechanism for reversing steam locomotives; also used to vary the period and degree of steam cut-off in the cylinders, permitting the steam to work expansively. Invented by William Howe in 1842, it was brought to the notice of Robert Stephenson, who developed the idea. There are two eccentrics carried by the crank



Link extinguisher outside a house

axle: one is set at the angle for forward motion and the other at the angular position for backward; the eccentric rods are connected at opposite ends of a curved link. A block free to slide in the link is connected by a pin to a valve rod which is in turn joined to the slide-valve spindle. The curved link can be raised to bring one eccentric into operation (e.g. for forward running), or lowered to cause the other eccentric to act upon the valve (backward running).

If the reversing lever be placed in positions intermediate to those mentioned, the valve is acted upon by both eccentrics, shortening its motion and increasing its angle of advance. This shuts off the steam from the cylinders earlier than if the full travel of either eccentric were employed; it permits the steam to do part of its work by expanding in the cylinders after the cut-off, and is a means of proportioning the power output of the engine to the load drawn. See Locomotive.

Linköping. City of Sweden, capital of the län or govt. of Östergötland. It stands on the river Stanga, near its entrance into Lake Roxen, 108 m. direct and 142 m. by rly. S.W. of Stockholm. The Kinda Canal traverses the city. The seat of a Lutheran bishop, its Romanesque cathedral, one of the finest churches in Sweden, was begun in 1150, completed in the 15th cent., and restored 1871-82, a lofty tower being added in 1886. The city possesses an ancient castle, museums, and a library containing over 100,000 volumes. The manufactures include tobacco, gilded mouldings, and hosiery. Timber is exported. Pop. 47,652.

Links. Word used in Scotland for ground bordering the coast, usually sandy and covered with coarse grass. The links of Forth is an example. On such waste ground the earliest golf was played, and the word has come to be the general term for a golf course. The most renowned links are at St. Andrews, and in England probably at Hoylake and Sandwich.

The course usually comprises 18 holes with a total length upwards of 6,000 yds. Three or four short holes from 100 to 200 yds. in length, and seven or eight long holes exceeding 400 yds., are usual.

Each hole consists of the tee, the green, and the ground between; the tee is a small level grassy space specially prepared to assist the golfer to make a good shot:

the green is a smooth grassy space, frequently undulating and set amid hazards, and here the hole is cut in different places from day to day. The fairway leads to the green. It is a narrow prepared stretch of grass with "rough," i.e. unprepared grass, heather, gorse, etc., on either side; a stretch of rough also joins the fairway to the tee. In addition to natural hazards bunkers are constructed to add to the difficulties of players who fail to take the correct line to the hole. See Golf.

Link Trainer. Ground training device for aircraft pilots invented by Edwin Link, American piano manufacturer, and introduced into flying schools in 1937. It became standard equipment with the R.A.F. shortly before the Second Great War. It simulates the conditions of blind flying, the pupil pilot being seated in an enclosed cockpit equipped with normal controls and instruments. There are ailerons on the tips of the stub wings, and an orthodox tail unit, but the fuselage pivots on a turntable. Control movements are transmitted through the inflation or deflation of bellows. The instructor can communicate by telephone with his pupil, and has a panel on which the latter's reactions are recorded.

Linlithgow. Royal and mun. burgh and co. town of W. Lothian, Scotland. It is 17 m. W. of Edinburgh, with a rly. station. The chief church is S. Michael's, built in the Gothic style in the 16th century, with a fine tower and other beautiful features. Secular



Linlithgow arms

buildings are the old town house, new town hall, and new county buildings. Cross Well is a stone fountain, rebuilt early in the 19th century.

Linlithgow, a tourist centre, is famous for the ruins of its palace. This was built in the 15th century, but later kings enlarged it, until it was perhaps the finest building of its kind in Scotland. It was a favourite residence of the kings, and here James V and his

daughter Mary were born. It overlooks Linlithgow loch. Linlithgow was made a royal burgh by David I, and its prosperity was due to the presence of the kings. Parliaments were held in the palace. In 1570 the regent Murray was assassinated here. Near is the village of Torphichen (q.v.), where the order of S. John of Jerusalem had its chief Scottish house. The town has distilleries and manufactures of paper, leather, and chemicals. It is governed by a provost and council. Market day, Mon. Pop. 3,666.

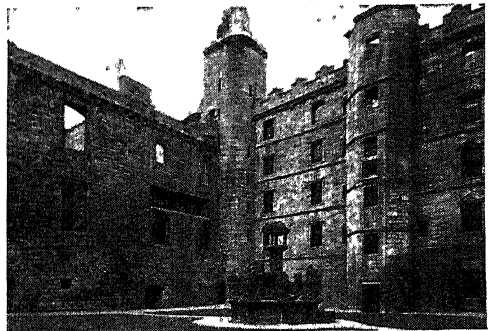
Linlithgow, MARQUESS OF. Scottish title borne since 1902 by the family of Hope. John Adrian Louis Hope, 7th earl of Hopetoun (1860-1908), was governor of Victoria, 1889-95, paymaster-general 1895-98, and from 1898 to 1900 lord chamberlain. In 1900 he went to Australia as first governor-general of the Commonwealth, and in 1905 he was secretary for Scotland. He was made marquess of Linlithgow in 1902, and died Feb. 29, 1908.

His son Victor Alexander John Hope (b. Sept. 24, 1887) succeeded to the title, after being at Eton. He was appointed viceroy and governor-general of India in 1936, his term being extended until 1943. He was chairman of many royal commissions; of the Medical Research Council 1934-36; president of the Navy League 1924-31; and chancellor of Edinburgh university from 1944. The seat is Hopetoun House, W. Lothian, and the eldest son is called earl of Hopetoun.

Linlithgowshire. Obsolete name of the Scottish county of West Lothian (q.v.).



2nd Marquess of Linlithgow



Linlithgow, Scotland. Courtyard of the palace. On the right were the private apartments, in a room of which Mary Queen of Scots was born

Linnaea borealis. Small creeping evergreen shrub of the family Caprifoliaceae. A native of Europe,

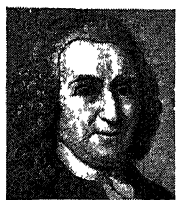


Linnaea borealis. Leaves and flower-stalks of the evergreen shrub. Inset, single flower

N. Asia, and N. America, it has thread-like stems, distant pairs of toothed, oval, leathery leaves, and tiny, sweet-scented, pink flowers somewhat bell-shaped with five lobes at the mouth. It grows in pine forests. Gronovius named it after Linnaeus.

Linnaeite. A cobalt mineral, cobalt sulphide (Co_2S_3) crystallising in the isometric system. It may also contain nickel. Atomic structure is a face-centred cube. Specific gravity is 4.8 to 5. In colour pale steel-grey, tarnishing copper-red, linnaeite is generally associated with complex ores of other metals, besides cobalt, especially copper, lead, and zinc. See Cobalt Ores.

Linnaeus, CARL (1707-78). Swedish botanist, called also Carl von Linné. He was born at Reashult,



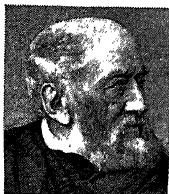
Smaland, May 23, 1707, the son of a clergyman. His early studies at Lund were mainly devoted to theology, but he soon showed a preference for botany, and this led to his study of medicine. Rudbeck, professor of botany and medicine at Uppsala, struck by his knowledge of plants, handed over to him his botanical work, including the care of the gardens, where Linnaeus laid the foundations of several important works, including *Bibliotheca Botanica*, 1736, and *Genera Plantarum*, 1737. In 1732 he undertook a botanical exploration of Lapland which resulted in the *Flora Lapponica*, 1737. Three years later he went to Holland, and was there, except for visits to England and France, till 1738. He

graduated M.D. at Leyden and on his return to Sweden practised as a physician at Stockholm. In 1741 he removed to Uppsala, and was appointed professor of botany at the university, which office he held until his death, Jan. 10, 1778.

During the Uppsala period Linnaeus produced works, large and small, covering the whole range of life, animal as well as vegetable, coordinating the work of his predecessors, gathering up the fragments and fitting them together with a clear idea of relative value and proportion, and making a firm foundation upon which his successors could build. His sexual system for the classification of plants was purely artificial, ranging species into orders and classes according to the number of stamens and pistils in their flowers, and so separating species that were obviously of close affinity. Nevertheless he was the first to define genera and species, orders and sub-kingdoms. For the diffuse descriptions formerly in vogue he substituted terse and clear diagnoses, and by his adoption of the binomial system of nomenclature he helped to make natural history exact and intelligible. The General View of the Writings of L., Sir R. Pulteney, 1871, catalogues his works.

Linnean Society. A British scientific society. It was founded on the initiative of Sir J. E. Smith, its first president, in 1788, "for the cultivation of the science of natural history in all its branches." In 1802 George III granted the society a charter giving it permanence and authority to pursue its stated objects "for ever hereafter." From its institution the society has exercised a most important influence in the development of natural science, and has numbered amongst its fellows (F.L.S.) all the foremost workers in botany and zoology. It possesses the collections and library of Linnaeus. It is located at Burlington House, London, W.

Linnell, JOHN (1792-1882). A British artist. Born in Bloomsbury, London, June 16, 1792, he



John Linnell,
British painter

studied at the R.A. schools. In 1812 he joined the Society of Painters in Oil and Water Colour. Beginning as a portrait painter, from 1847 he devoted himself to land-

scapes, chiefly in oils. He was a close friend of William Blake, and commissioned the replicas of the Job series and the Dante drawings and plates, which were in his possession when he died at Redhill, Jan. 20, 1882. Of his works may be mentioned his Noon-day Rest, in the Tate Gallery.

Linnet (*Carduelis cannabina*). Familiar British song-bird of the finch group. It is found through-



Linnet, a male of the British song-bird

out nearly the whole of Europe, and is commonly met with on waste land where gorse grows. The plumage is a warm brown above, the male with crimson forehead and chest, and brownish-white below. The beak is short, conical,

and strong. The linnet feeds mainly on seeds, and derives its name from its fondness for linseed. In Scotland its place is largely taken by the twite or mountain linnet. It builds its cup-like nest of twigs, fibres, and wool in low bushes. A pleasing songster, it was long a favourite cage bird. See Egg, colour plate.

Linne. Sea loch of Argyllshire and Inverness-shire, Scotland. It extends N.E. from the Firth of Lorne to Corran Narrows, and thence as Lower Loch Eil to Fort William on the Caledonian Canal. Its length is 30½ m. and its greatest breadth 8 m.

Linoleic Acid ($\text{C}_{18}\text{H}_{32}\text{O}_2$). Pale yellow oil prepared from linseed, hemp, poppy, and other vegetable oils. It occurs in the oils as the glycerol ester, from which the acid is prepared by saponification with caustic soda, and treatment with bromine to separate the linoleic acid from the other fatty acids with which it is associated.

Linoleum. This floor covering is described under Floorcloth.

Linotype. Printers' machine that casts a line of type from a previously assembled line of matrices which have been collected by the depression of finger-keys on the typewriter principle. It was invented by Ottmar Mergenthaler (1854-99), a German-American watchmaker, and introduced into England from the U.S.A. in 1889. From Caxton's days until the adoption of one or two earlier machines of a totally different

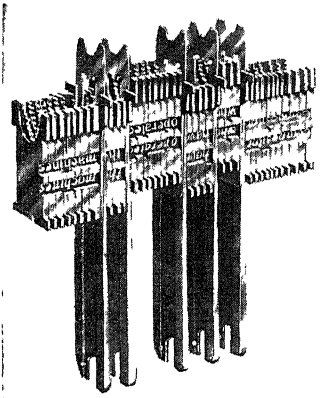
kind, all printed matter was set up by hand; but the linotype was the first machine wholly automatic, and entirely embodying within itself all those functions required to set, cast, and distribute, these operations being done simultaneously by one man. To this and similar machines we owe our comparatively cheap literature of today, the output of one linotype operator being equal to four hand compositors.

In its evolution the first attempts were by machines con-

sisting of an inclined stationary magazine consisting of as many compartments as there are letters on the keyboard. These are held in check by a small brake, one at the mouth of each compartment. The brake is released by the action of the key, and the foremost matrix falls out by its weight, the one behind it being held back by the brake on its return position. The loose matrices travel down vertical channels one after another, and are delivered down a travelling belt into an assembler box in which they are collected side by side. The contour of the channels and speed of the belt are so arranged that the matrices which have to travel from varying distances to the assembly point take each exactly the same fraction of a minute to do the journey.

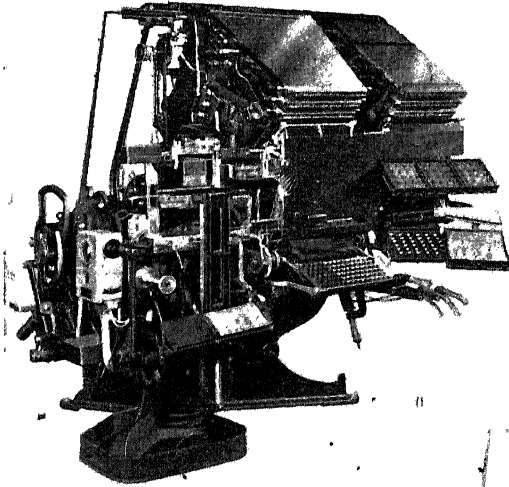
The matrices constituting the words are divided and spaced by steel wedges which, when the space key is touched by the operator, fall into the assembling line between the words, and when the line of words is completed the space wedges are automatically forced upwards between the words, and the line of matrices thus becomes wedged tightly as the line is accurately spaced to the predetermined measure.

The matrices constituting the words are divi-



Linotype. Assembled line of matrices and spacebands, justified and ready for casting

d and spaced by steel wedges which, when the space key is touched by the operator, fall into the assembling line between the words, and when the line of words is completed the space wedges are automatically forced upwards between the words, and the line of matrices thus becomes wedged tightly as the line is accurately spaced to the predetermined measure.

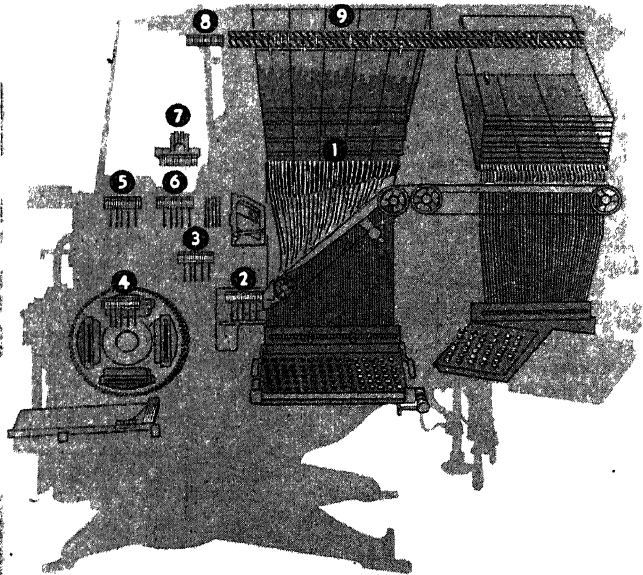


sisting of steel letters, which indented the characters one by one on *papier-mâché* to form a stereo mould. These letters are now made of brass and themselves form the mould direct.

The linotype in its broad principles is the same as the intertype, and its fundamental elements are matrices or dies for each letter of the alphabet, varying in quantity according to the letters most in common use. The operator manipulates a keyboard, and when one of the keys is depressed it releases a matrix which falls into an assembling channel. When all the matrices constituting a line have been thus gathered together and automatically spaced (*see illustration top of col. 3*), molten metal is pumped into the completed line, and a solid line of letters in relief is produced.

The working of the machine consists of three main functions—setting up the matrices, casting the type, and returning the matrices to their magazines.

Each time a key is depressed it permits a single matrix bearing a corresponding character to escape

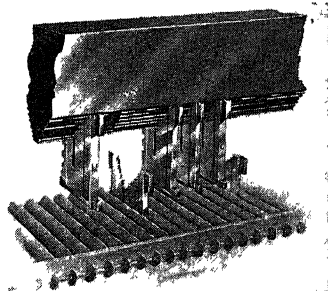


Linotype. Top, 8-magazine linotype. Below, diagram showing path of matrices through the machine. 1. Matrices leaving magazine, released by depression of key buttons. 2. Matrices and spacebands assembling in line formation. 3. Completely assembled matrices being transferred to first elevator. 4. Matrix line in front of mould for justification and casting. 5. Matrix line after casting being carried for transfer to second elevator. 6. 7. Matrix line, now free of spacebands, rising to level of distributor bar suspended over magazine. 8. Matrices being separated into single units. 9. Matrices passing along distributor bar until their combination of teeth causes them to fall into their original channels for re-assembling

Courtesy of Linotype & Machinery, Ltd

The combined line of matrices and space wedges is now transferred by the action of a lever depressed by the operator to a chamber contained in a revolving wheel. In the former there is a recess into which a line of matrices fits, and into this molten metal is pumped against the face of characters on the line of matrices from a gas or electrically heated metal pot, the temperature of which is thermostatically controlled. The metal solidifies on contact, and after the ragged edges of the metal have been cut away by a trimming knife, a composite "line-o'-type" becomes the finished product of the machine, hence its name. It is now ejected from the casting compartment, and bears upon its upper edge characters to print an entire line. These lines are bars of type which make up the column of a newspaper or periodical.

After a cast has been taken from the assembled matrices it obviously becomes necessary to



distribute them back again to their separate compartments in the magazine. The line of matrices is first lifted vertically by means of an arm-elevating lever, and then pushed laterally on to a bar on which are ribs engaging with teeth on the matrices like the wards of a lock and key. The space wedges are left behind, and are transferred *en bloc* to their own magazine. The matrices, suspended by their teeth, are made to travel along the bar by distributor screws which engage with the extremity of each matrix, and when they arrive at that portion of the bar from which the same combination of teeth as in the matrix has been removed, it falls by its own weight into its own compartment immediately under this particular section of the bar; the matrices of the characters used most, such as e, t,

a, o, i, n, travel the shortest distance and return soonest to the magazine. See Compositor; Forme; Intertype; Monotype; Printing, etc.

Linseed (Lat. *linum*, flax). Dry ripe seeds of *Linum usitatissimum*, the flax plant. Linseed is mainly used for poultices, and linseed oil was formerly a popular remedy for burns.

Linseed Cake. Valuable feeding stuff obtained as a by-product after the extraction of oil from linseed, and useful for all classes of farm livestock of all ages. The composition of the feeding stuff depends on the degree and method of extraction, but the following are average percentage figures: protein 30; oil 10; carbohydrates 35; fibre 9; ash 5.

Linseed Oil. A derivative of the seeds of the flax plant (*Linum usitatissimum*). The variety of plant grown for oil production is about 18-24 ins. high and the stem is more branched than that grown for the bast tissue. The seed contains 38-41 p.c. of oil, which is extracted either by pressure or by solvent. The former process leaves 5-10 p.c. of oil in the cake which forms a valuable food for cattle.

Linseed oil contains a higher proportion of unsaturated fatty acids as glycerides than any other commercial vegetable oil. When exposed to the air in thin films these combine with oxygen to form a tough leathery film (lin-

refined with alkali. The physical properties of these varieties differ in their behaviour with pigments, but all find use in paint and varnish. Alkali-refined oils are edible and can be hydrogenated to form solid fats. Oil to which driers have been added is known as boiled oil. Heat-thickened oils are known as stand oils or litho oils; they are used in printing inks, particularly in the lithographic process.

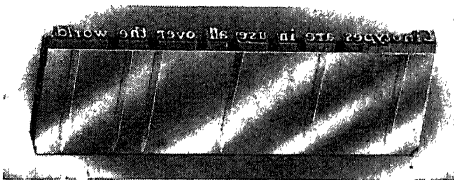
The world production of linseed fluctuates considerably; in 1912 it reached a peak figure of over 3,000,000 tons and is usually over 2,000,000 tons. Argentina is now the largest producer, yielding about 1,000,000 tons, and India is important, Calcutta oil being of high quality. The best oil, however, still comes from the Baltic states, including that from Baltic seed grown for one year in Holland.

Lin Sen (1864-1943). Chinese president. He was born at Foo-chow, and was educated partly in the U.S.A. There he published Chinese journals supporting Sun Yat-sen (*q.v.*), whom he joined soon after the revolution of 1911. Becoming a member of the central executive committee of the Kuomintang in 1924, Lin Sen held several high offices before assuming the presidency in 1932. His position was a nominal one, Gen. Chiang Kai-shek controlling the government, but he was venerated by the nation for his moral integrity. Lin Sen died at Chungking Aug. 1, 1943, being succeeded by Chiang Kai-shek.

Lint. Word originally used for the flax plant. There are remains of this in Scottish poetical phrases, e.g. lint white locks. It was then used for the flax when ready to be spun, and for the waste material left over. It is now used for linen made into a soft substance and used for dressing wounds.

Lintel. Horizontal bar of stone, wood, or other material. It is placed over two vertical supports to form the framework of a door, window, or other aperture in a wall, and to carry the weight above it.

Linton, ELIZA LYNN (1822-98). British novelist and journalist. She was born at Keswick, Feb. 10, 1822, daughter of the Rev. J. Lynn, vicar of Crosthwaite. She came to London in 1845, and in 1847 published her first story, *Azeth the Egyptian*, anonymously. She married W. J. Linton (*v.i.*) in 1858. In 1868 she created a sensation by a series of papers in *The Saturday Review* on *The Girl of the Period*,



Linotype. Solid line of type cast from assembled matrices. Top left, part of matrix distributor mechanism

Courtesy of Linotype & Machinery, Ltd.

oxyn). Under normal conditions this occurs in about 8 days, but by the addition of driers the time can be reduced to 8 hours. Heated to 500-600° F., the oil gradually thickens, eventually becoming almost solid. These properties make it an essential ingredient of paints and varnish.

"Raw oils" as expressed from the seeds contain varying amounts of mucilage which must be removed. Formerly this was effected by long tanking, as much as three years, but more rapid means are now used. Oil may be purified with sulphuric acid or

and in 1872 made a hit with *The True History of Joshua Davidson*. Among her writings are *Sowing the Wind*, 1867; *Patricia Kemball*, 1874; *The Autobiography of Christopher Kirkland*, 1885; *My Literary Life*, 1899. She died July 14, 1898.

Linton, WILLIAM JAMES (1812-98). British engraver. Born in E. London, Dec. 7, 1812, he studied



W. J. Linton,
British engraver

under G. W. Bonner, and was associated with Orrin Smith. After experiments in journalism in the north of England, he came to London 1855, and was soon recog-

nized as the best wood engraver of his day. He engraved drawings by pre-Raphaelite artists for Moxon's edition of Tennyson. After 1866 he resided in the U.S.A., as head of a large engraving establishment, and a writer on his own art. He died at New Haven, Conn., Jan. 1, 1898. A close friend of Mazzini, Linton was an active politician in his younger days, and did much to propagate republicanism. His poetic work, though little known, has been highly appreciated by critics.

Linum. Genus of plants belonging to the family Linaceae, the most important member of which is flax (*q.v.*).

Linus. In Greek mythology, the son of Apollo by one of the Muses. He was exposed by his mother at birth, but was brought up by shepherds, and torn to pieces by dogs, or in another version was killed by Apollo, with whom he had engaged in a musical contest. Originally a vegetation-god, like Adonis (*q.v.*), he was annually lamented in dirges (Gr. *linoi*) at harvest.

Linz. Capital of Upper Austria. It is situated 95 m. by rly. W. of Vienna, at the outlet of the Danube from the Alpine mountains, mainly on its right bank but linked with the left one by a 900-ft. bridge. Linz has been a political, administrative, intellectual, and industrial centre of the first rank. Founded about the Roman castle *Lentia*, it was a fortified city from 1236, with urban rights from 1324.



Linz arms

It suffered in many wars, was taken by the Bavarians in 1741 and by Napoleon in 1805 and 1809, yet preserved some fine old buildings, e.g. the Jesuit cathedral (1669), town church (15th century), town hall (15th century). Pleasant surroundings made Linz a tourist centre, with 150,000-200,000 visitors yearly up to 1938. Its industries comprise textiles, locomotive, engineering, and chemical plants, foodstuffs, printing, and furniture factories. There are high schools, hospitals, museums, and an art gallery. In the Second Great War it surrendered to the U.S. 11th armoured div., May 5, 1945. Pop. 128,195.

Linz Symphony. Composition in C major by Mozart. His 36th symphony, it has the Köchel catalogue number 425. Written at Linz in 1783, it shows many traces of Haydn's influence and is in strong contrast with the earlier Haffner and later Prague symphonies.

Lion (*Felis leo*). Largest member of the cat genus. It now occurs only in some parts of Africa and S.W. Asia, though once common in Europe. Remains of lions (*F. spelaea*) have been found in most counties of England, but not in Scotland or Ireland. It was certainly contemporaneous with early man in England, and it occurred in Greece and the Balkans within the historic period. The lion has deteriorated in size and strength, and its supposed courage and nobility of character are not altogether confirmed by facts. It is certainly not so courageous as the tiger and leopard; and in the wild state it has not the dignified appearance of the fine-maned specimens seen in zoological gardens and menageries.

A lion may measure 9 ft. from the nose to the top of the tail, and weigh up to 500 lb. The hair is tawny yellow, varying considerably in tone; the mane may be black or brown; and the tuft of the tail is often black. The cubs are spotted, with a tendency to striping; but these markings disappear as the animal grows, though faint spots are often noticeable on the legs and under-sides of adult females. In captivity, specimens sometimes attain an age of 15 years, but in the wild state they are known to live for over 30. Anatomically the lion differs little from the tiger. In the lion the upper extremities of the nasal and upper jaw bones are level, whereas in the tiger the nasal bones are distinctly



Linz, Upper Austria. Main square and 17th century cathedral

higher. There is also a difference in the shape of the lower jaw and in one pair of the teeth. The creature is distinguished from all other cats by an absence of spots or stripes in the adult; the mane of long hair found only on the male; and the tuft of hair on the tip of the tail.

Only one species of lion is recognized by zoologists, though there are several local varieties, Indian, Persian, Masai, Senegal, and Somali lions. They differ merely in size, tone of colour, and development of the mane. Lions are found both in the forests and in the open country, and are nocturnal in their habits, roaming long distances by night in search of prey. The food consists of antelopes and other mammals, for which the lion lies in wait near the drinking places to which these animals resort. Lions usually hunt in pairs, and recent observers state that it is the lioness who first advances to the attack. The common idea that the lion roars in order to strike terror into its intended prey and to reduce it to a state of confusion is unfounded. The roaring seems to be rather in the nature of a recognition call or challenge, as the roars are answered by any other lions in the neighbourhood.

The stories of man-eating lions seem to be exaggerated. As a rule the animals rarely attack unless wounded. In the neighbourhood of farms or native settlements they are often a serious nuisance as soon as they have discovered that domestic goats and cattle are more easily captured than wild animals; and here sometimes women and children and even sleeping men are carried off. But it is usually an old lion, no longer capable of

hunting effectively, that takes to these courses

As a rule the lion mates for life, and one litter of cubs is produced each season, usually consisting of two or three, though in captivity the litter may number as many as six. When the lioness has cubs she is exceptionally ferocious and dangerous to approach.

The Indian lion is as a rule rather smaller than the African variety, and less heavily maned. It has been extinct since about 1885 except in the Gir forest of Kathiawar, where it is to some extent preserved. In Persia and Iraq it is still found, and in bygone times it seems to have occurred fairly often in the Jordan Valley and around Mount Lebanon. See *Animal*, colour plate, *Mammal*.

Lion. In heraldry, a much esteemed charge. In the best art it is a conventional representation of a



Lion of Lucerne. Thorwaldsen's monument, hewn in the living rock, commemorating the Swiss Guards who fell defending the Tuileries, Aug 10, 1792

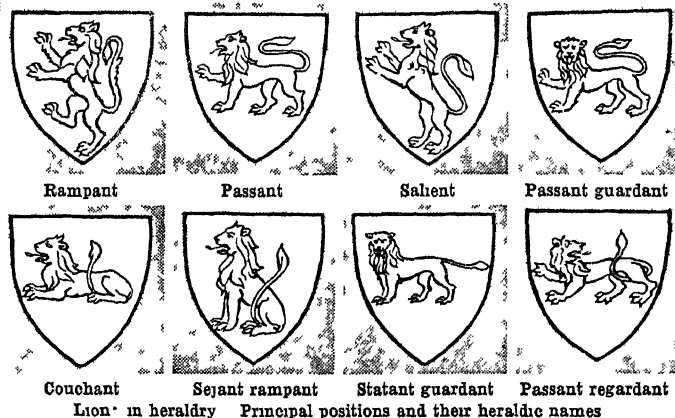
stage at the Olympic in 1896, later securing a reputation in Galsworthy's dramas. He entered into management at the New Theatre in 1918, his productions including

Lion of Lucerne. Monument hewn out of the natural sandstone rock in the Glacier Garden of Lucerne. It was designed by Thorwaldsen, and portrays a dying lion protecting the Bourbon lily with its paw. It was executed in 1821 and dedicated to the memory of the Swiss Guards who perished in defending the Tuileries in Paris on Aug 10, 1792. The figure of the lion is 28 ft. long.

Lion of S. Mark. Bronze figure of a winged lion, standing on a granite column in Venice. The legendary emblem of S. Mark, the patron saint of Venice, it was cast for the doge about 1178, and was set up in its present position on the Piazzetta, facing the sea, in 1180. In 1797 it was removed to Paris by Napoleon, but it was returned in 1816; it was then in pieces, in which state it remained until 1893. On another column, the fellow of this one, is a marble statue of S. Theodore standing on a crocodile. This dates from 1329. See *Venice*.

Lion's Ear (*Leonotis*). Genus of herbs and shrubs of the family Labiatae. Natives of Africa, E. Indies, and tropical America, they have tubular, showy, red or yellow flowers, mostly disposed in whorls. *L. leonurus*, the lion's tail, frequently grown in green-houses, is a shrubby plant from S. Africa, with lance-shaped leaves and large scarlet flowers.

Liotard, JEAN ÉTIENNE (1702-89). Swiss painter. Born at Geneva, he studied with a



Lion in heraldry. Principal positions and their heraldic names

fierce beast with shaggy mane and long tufted tail. It is shown in many positions. The principal are: (1) rampant, or rearing on its hind legs, if full faced, the word guardant is added, if looking backwards, regardant, (2) passant, walking past, with its right paw lifted; if full faced it is passant guardant, if looking backward, passant regardant. The lions of England are passant guardant, in older times they were known as leopards or lions leopardé. See *Charge*, *Heraldry*.

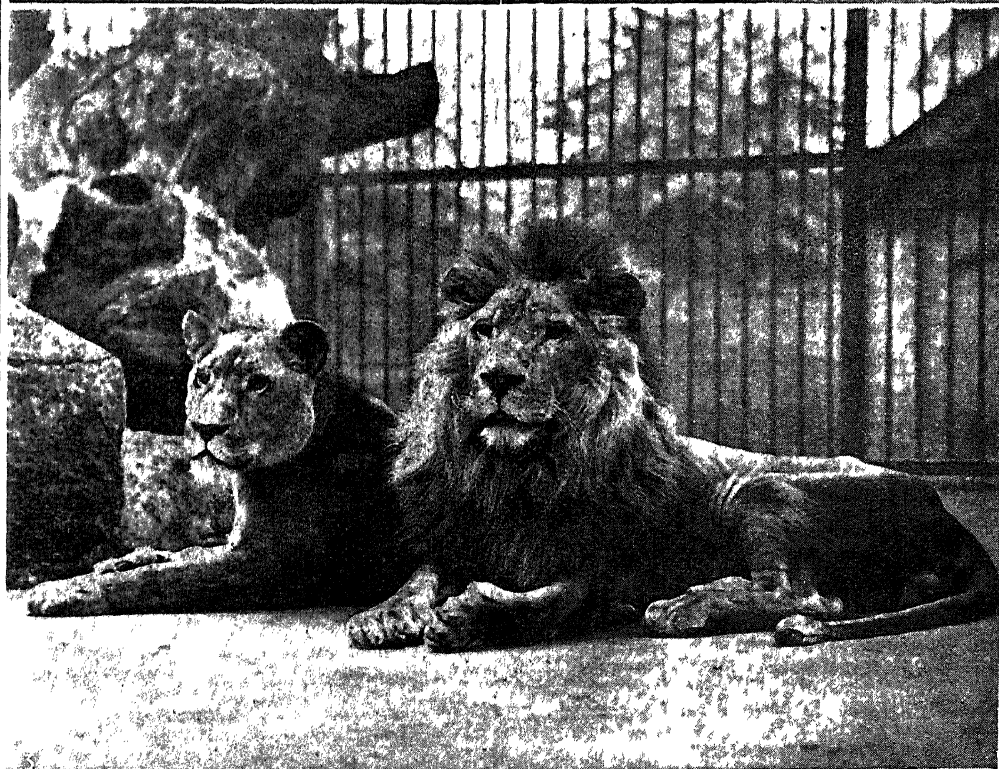
Lion, GULF OF THE. Great bay of S. France. It is that section of the Mediterranean Sea between Toulon and Perpignan into which the Rhône flows. Marseilles, Cette, Narbonne are the chief places on the bay. See *Mediterranean Sea*.

Lion, LEON M (1879-1947). English actor and manager. Born March 12, 1879, in London, he made his first appearance on the

The Outsider, *The Fanatics*, *Awake and Sing*, *Many Waters*. In 1928 he was invited by the French government to represent Great Britain at an international festival, when he produced *Justice and Loyalties*, and was awarded the legion of



Lion of S. Mark. Bronze figure of a winged lion, cast in 1178, and set up on a pillar in the Piazzetta, Venice



1 Head of African lion, showing the heavier mane which distinguishes this variety from the Asiatic lion illustrated in 2 3 African lion and lioness The lioness has no mane, and is fiercer than her mate

LION: TYPES OF THE LARGEST MEMBER OF THE CAT TRIBE

Gambier Bolton F Z S

local teacher, and in Paris under J. B. Massé and F. Lemoine. Adopting the style of Watteau,



Jean Liotard,
Swiss painter

he obtained rapid recognition for his agreeable and delicately finished art. He travelled about in Italy and the Levant, painting portraits and miniatures, and

finally returned to Paris in 1751. After further voyages to England and Holland, he died at Geneva. See illus. *Épinay, d'*.

Lip. A muscular organ which bounds the mouth. From front to back the lips consist of four layers, cutaneous, muscular, glandular, and mucous. The skin and the mucous membrane become continuous at the margin of the lips. The chief muscle in the muscular layer is the *orbicularis oris*, which surrounds the mouth, while other muscles converging upon the mouth enter into the formation of the lips.

Lipari OR AEOLIAN ISLANDS. Group of seven volcanic islands and ten islets, lying about 20 m. distant from the N. coast of Sicily. They are attached to the Sicilian prov. of Messina. Total area is 46 sq. m. All are mountainous; Stromboli (*q.v.*) is actively volcanic, and Vulcano intermittently. Lipari is the largest, and the remaining islands of importance are Alicudi, Salina, Panaria, and Filicudi. The soil is fertile, producing currants, olives, etc., other products being sulphur and pumice-stone. Lipari is the capital. A Greek colony was established there in the 6th century B.C., and on the defeat of the Carthaginians the islands became Roman in 252 B.C. The Romans called them the *Insulae Vulcaniae*. Under Mussolini's regime the islands were used as a penal settlement for anti-fascists. The Italian garrison surrendered to a U.S. naval force on Aug. 17, 1943. Pop. 16,200.

Lipari. Harbour and capital of the island of Lipari, belonging to Italy. It stands on the slope of a hill on the E. coast, and its most prominent feature is a castle built by Charles V on an eminence overlooking the town. The chief products are sulphur, pumice-stone, currants, wine, and spirits. There are also numerous Greek and Roman remains, and in the vicinity there are warm sulphur springs with vapour baths.

Liparite. In geology, a highly siliceous variety of lava which chemically resembles granite. It is common in the Lipari Islands. The term is synonymous with rhyolite (*q.v.*). See *Igneous Rocks*.

Lipase. Enzyme which saponifies fats. It is abundant in oily seeds, such as castor oil, rape, and flax, during germination. It decomposes fats into acids and glycerine, and by its reversible action synthesises fats from these components. During germination the enzyme digests the oil and makes it available for the nutrition of the young embryo.

Lipetsk. Town of R.S.F.S.R. It is in the Voronezh region, 70 m. W. of Tambov, and is on the Voronezh, a tributary of the Don, and the Orel-Stalingrad rly. There are soap and sugar factories, and iron foundries. The chalybeate waters have long been famous. Population 66,625.

Lipogram (Gr. *leipein*, to leave; *gramma*, a letter). Exclusion of a particular letter, or letters, from a literary composition. It is no more than a fantastic conceit, yet Tryphiodorus, a Greek writer of the 6th century A.D., wrote a poem in 24 books on the fall of Troy, excluding the letter alpha from the first book, beta from the second, and so throughout the remainder. Lope de Vega wrote five novels from each of which one of the vowels was excluded.

Lipoma (pl. lipomata; Gr. *lipos*, animal fat). Tumour composed of fibrous tissue infiltrated with fat. Lipomata vary in size from that of a pea to that of an orange, and most often originate in the tissues immediately beneath the skin. They may be single or multiple, and may occur on any part of the body; but most frequently are found on the trunk or upper extremities. Occasionally lipomata grow from the deeper tissues. The simple infiltration of the subcutaneous tissues is sometimes called a diffuse lipoma. The ordinary lipoma is not affected by drugs, and the only treatment is surgical removal.

Lip - ornament. An object attached to the human lip, usually by perforation. Limited to some American and African peoples, they are made of stone, bone, shell, feather, wood, or metal, sometimes engraved or inlaid. Originally amuletic, to guard the portal of the mouth against malignant spirits, they are especially characteristic of aboriginal America, where they are called labrets (Lat. *labrum*, lip). Ex-

amples occur in ancient Aleutian and Florida shell-mounds. Among the W. Eskimos each corner of the mouth is pierced, mostly by men, for the insertion of detachable studs, a custom presumably arising from the fact that the body parts preferred for ornamentation by mankind at large are concealed under the skin-clothing of Arctic lands. The Haidas and Thlinkits sometimes insert horizontal plugs, up to 6 ins. long, in the distended lower lips. The Central and S. American mode, observed among the Aztec, Chibcha, and Carib peoples, comprised pear-shaped pendants, supported by flanges or string loops passed through the lower lips. The modern Botocudos use plugs, sometimes weighing 4 oz. Needle tattooing of the lips also frequently occurs.



Lip - ornament and distortion as practised by African tribes. 1. Makonde, E. Africa. 2. Sara, Sudan. 3. Shari river tribes, Central Africa. 4. Gribangi, Congo

In Africa the most developed form is the Nyasaland pelec, a hollow disk worn in the upper lip. Most Nilotic peoples pierce one lip; Sudanese Sara women carry long horizontal plugs in both lips, giving them the appearance of spoonbill beaks. Baluba women wear upper disks and lower pendants. These are sometimes rock-crystals or fossil belemnites.

Lippa. Town of Rumania. It is on the left bank of the Maros river, 22 m. E.S.E. from Arad, and is the first junction on the rly. from Transylvania through the Maros gorges. It has cattle fairs and manufactures of pottery.

Lippe. River of Germany. It is a right bank tributary of the Rhine, into which it falls near Wesel. Rising in the Teutoburger Wald, it flows W. through Westphalia and is navigable for small vessels from Lippstadt. Its chief tributaries are the Pader, the Ahe, and the Stever, and its length is 150 m. It

serves an agricultural district, Westphalia being to the south.

Lippe. Name of a former small state of W. Germany. Until 1918 a sovereign principality, then a republican free state, it was under the Nazi regime united with Schaumburg-Lippe as the area of a *Gau*leiter. After the occupation of Germany, 1945, Lippe was in the British zone and became part of N. Rhine-Westphalia. Ethnically Westphalian, geographically a borderland between Hanover and Westphalia, watered by the river Lippe, this is a mainly agricultural country, with some textile, cigar, and brick industries. Its capital was Detmold, with 17,000 inhabitants. Known as Luppia to Tacitus, the principality arose with separate sovereignty in the 12th century; was confirmed in 1529 as a county for Simon V, who introduced the Reformation; joined the federation of 1814, the North German confederation of 1866, and the empire of 1871. The falling of the succession to an insane prince, the last of his line, was the subject of a famous lawsuit, 1897-1905, which was lost by the Kaiser's brother-in-law, and won by the line of Lippe-Biesterfeld, to which Prince Bernhard of the Netherlands belongs. Area, 470 sq. m. Pop. 188,598.

Lippersheym, HANS. Flemish youth who is supposed to have discovered the principle of the telescope by accident in 1608 or 1609. See Galilei; Telescope.

Lippi, FRA FILIPPINO (1460-1504). Italian painter. Born at



Fra Filippo Lippi. The Annunciation, one of this Florentine artist's richest works, now in the National Gallery, London

Prato, Tuscany, son of Fra Filippo Lippi and the nun Lucrezia Buti, he studied chiefly under Botticelli. Important frescoes by him decorated the Brancacci chapel



Filippino Lippi, Italian painter
Self-portrait

of the Carmine and the Filippo Strozzi chapel of S. Maria Novella, Florence (1502). His work reveals a quietly reverent, sensitive artist. Three of his easel pictures are in the National Gallery, London. He enjoyed a great reputation at Florence, where he died April 15, 1504.

Lippi, FRA FILIPPO (c. 1406-69). Italian painter. He was the son of a Florentine butcher. As an orphan he entered the convent of S. Maria del Carmine, but left it in 1432. He is first mentioned as a painter in 1430, and was the pupil of Lorenzo Monaco, though greatly influenced by Masaccio and Fra Angelico. An altarpiece painted for the nuns of S. Ambrogio brought him to the notice of Cosimo de' Medici and of the pope. In 1437 he executed the altarpiece of the Virgin and Child Enthroned for the Barbadori chapel in S. Spirito; this is now in the Louvre, Paris.

In 1452 he was made chaplain of the convent of San Niccolò de Fieri, Florence, and a little later obtained a similar post at S. Margherita, a convent of nuns, at

Prato, whence, according to Vasari, he abducted the beautiful Lucrezia Buti. The child of this union was Filippino Lippi (v.s.). Filippo's work at Prato includes the frescoes of SS. Bernard and John the Baptist and the Death of S. Jerome, now in the cathedral. The last two years of his life were passed at Spoleto. His best known works are the Nativity in the Academy at Florence; a Madonna and child at Berlin; the Coronation of the Virgin in the Lateran, Rome; the Four Fathers of the Church in the Albertina Gallery, Turin; and the Annunciation, and the S. John the Baptist with six other Saints in the National Gallery, London. Botticelli was his greatest pupil.

Fra Lippo Lippi's story is told in lively verse by Robert Browning.

Lippincott, JOSHUA BALLINGER (1813-1886). American publisher. Born at Burlington, N.J., he entered the book business in Philadelphia in 1828, and in 1836 there founded the publishing firm of J. B. Lippincott & Co. He was succeeded in the business by his sons Craig



(1846-1911) and Joshua Bertram (b. 1857). The concern specialises in educational works and medical textbooks, and publishes a comprehensive world gazetteer.

Lippman, GABRIEL (1845-1921). French scientist and inventor. Born Aug. 16, 1845, in Luxemburg, he went to Paris as a boy,



Filippino Lippi. The Vision of S. Bernard, a fresco altarpiece in the Badia, Florence, painted by the artist in 1480

and there produced a treatise on the relation between electrical and capillary phenomena. He taught experimental physics at the Sorbonne. In 1891 he invented a method of colour-photography known as the Lippmann interference colour process. The Nobel prize for physics was awarded to him in 1908, and later he became president of the Académie des Sciences. During the First Great War he invented an apparatus to detect the approach of a submarine. He died July 13, 1921.

Lippstadt. Town of W. Germany, in the *Land* of North Rhine-Westphalia. It stands on the Lippe, 37 m. by rly. W.S.W. of Paderborn. Once a member of the Hanseatic League, with urban rights since 1196, it manufactures engines, iron, wire, and twine. On April 1, 1945, the U.S. 1st and 9th armies made contact near here, encircling the Ruhr area. Unlike all other big Westphalian towns, Lippstadt was unscathed in the Second Great War. Pop. 18,498.

Lip-reading or **SPEECH-READING.** Art of understanding the speech of others by interpreting the visible movements of the speaking mouth. The movements of the lips and tongue, together with the expression of the face, take the place of the sounds and expression of the voice. It is the chief means of communication employed in the education of deaf children taught on the oral method. Of its two methods, the analytic first teaches the phonetic elements of speech, then combinations, and finally words and sentences. The synthetic begins with words and

lips and facial muscles of the speaker, and then their mental interpretation. The mental side of lip-reading consists in grouping the movements into words, substituting by aid of the context sounds and words for those which have been misread on account of their similarity in movement, and finally grasping the thought of the speaker. *See* Deaf, Training of.

Lipton, Sir Thomas Johnstone (1850–1931). British merchant and yachtsman. Born in



Sir Thomas Lipton.
British merchant.
Elliott & Fry

Glasgow, May 10, 1850, of Irish parentage, he was first an errand-boy, and, going to the U.S.A. about 1865, worked there as a clerk, a tram driver, and on rice plantations. He returned to Scotland in 1876, and opened a grocer's shop in Glasgow, which developed under his direction into a huge concern with interests in the U.S.A. and Ceylon, as well as throughout Great Britain. He was knighted in 1898, and in 1902 was made a baronet. Lipton made several attempts to win the America's Cup with his Shamrock yachts. After Shamrock V was defeated in the 1930 series, he received a consolation cup for his outstanding sportsmanship. Died Oct. 2, 1931.

Liquation. Metallurgical term. When a solid mixture of substances is heated, the more fusible portions melt first and may in this way be separated. Metals and

Liquefaction. Term for the change of state of a substance from a solid or a gas to a liquid, usually restricted to those gases which do not condense at normal atmospheric temps. and pressures.

By decreasing the temp. of some gases, e.g. sulphur dioxide, to -8°C ., liquefaction occurs at atmospheric pressure; by increasing pressure on some, liquefaction occurs at room temp., e.g. carbon dioxide will liquefy at room temp. if the pressure be increased to 50 atmospheres. Earlier workers, prominent among whom was Faraday (1791–1867), succeeded in liquefying most gases known to them. Hydrogen, methane, oxygen, and nitrogen resisted their efforts, even though the pressure was increased to more than 2,000 atmospheres (about 30,000 lb. per sq. in.); and they were accordingly called permanent gases.

In 1869 Andrews showed that, with sufficiently high pressure, carbon dioxide will liquefy provided its temp. does not exceed 31.1°C . If it is higher, no matter what pressure is used, liquefaction is not possible. This temp. is called the critical temp. and it is in this phenomenon that the explanation of the apparent permanence of some gases can be found. A gas must be cooled to below its critical temp. before it can be liquefied. In order to do this, some difficult problems of refrigeration (*q.v.*) had to be solved, as will be seen from the following list of critical temp.: methane -88°C ., oxygen -125°C ., argon -128°C ., nitrogen -153°C ., hydrogen -246°C ., helium -274°C .

The best freezing mixture, Thilorier's, a mixture of solid carbon dioxide and ether, gives a temperature which does not fall below -110°C . For temps. below that, other methods had to be evolved. Pictet used the principle of cooling by evaporation for liquefying a number of gases. The rapid evaporation of one liquefied gas produces a temp. which will liquefy another gas with a boiling point lower than the first. The liquefied second gas can then be evaporated to liquefy a third.

Methods based on gas expansion are used for the liquefaction of "permanent" gases. The fall in temp. in a gas when it expands adiabatically (no transfer of heat to or from the gas) and does external work is the basis of the Claude process for the manufacture of liquid air. Pure air is compressed, cooled, and then allowed to expand against a pressure, thus



Lip-reading. Four pictures illustrating the successive shapes of the lips in pronouncing the word father. Left to right, F, AH, TH, ER

phrases, and even sentences. The Muller-Walle method, the basis of which is the syllable, comes from Berlin. It is favoured in America for hard-of-hearing adults. It may also be used for deaf children who have acquired some speech and a fair command of language; and finally, for persons who may be described as semi-mute and semi-deaf.

Lip-reading is a twofold process, involving first the perception of the various movements of the

their ores may be parted by this means. The ore is heated on a sloping hearth so that the easily fused metal can run away into a well. This method has been used for extracting bismuth, separating silver-bearing lead from copper, and concentrating low-grade ores of antimony. When certain alloys are solidified, a lower-melting constituent, often a eutectic, oozes in droplets from the crust. An example of this type of liquation is "tin sweat." *See* Bronze.

doing external work. The cold, expanded air is used to cool still more the incoming compressed air, and the temp. falls so far that, on expansion, the air liquefies.

When a gas expands without doing external work there would be no heat change if the gas obeyed the theoretical gas laws, but, since no gas is perfect, there is in fact some change. Joule and Thomson showed that if a gas below a certain temp. (240° C. for air at 200 atmospheres pressure, -79° C. for hydrogen, and -173° C. for helium) expands in this manner there will be a fall in temp. consequent upon expansion. Linde and Hampson both made apparatus which uses this principle for the liquefaction of air. Compressed air is passed through the inner of two concentric tubes and then allowed to expand through a valve. The cooled and expanded air returns through the outer tube thus cooling air approaching the valve, and finally is recycled. With each cycle there is a reduction in temp. and the process is continued until the point is reached at which the air condenses as it leaves the valve. The application of this principle by Linde, Dewar, Onnes, and others has resulted in the liquefaction of all known gases. Hydrogen (b.p. -252° C.) is liquefied by being compressed, cooled by liquid air, and then expanded through a fine jet; helium (b.p. -269° C.) by using solid hydrogen, produced by rapid evaporation of the liquid, as the cooling medium.

The liquefaction of gases is of great importance not only from the point of view of science, but also for industrial and even domestic purposes. The liquefaction of certain gases, *e.g.* carbon dioxide, ammonia, and their subsequent rapid evaporation is the method of cooling used in most domestic and large scale refrigerators. Liquefaction makes possible the storage in small space and the easy handling of large quantities of gas, *e.g.* chlorine, nitrous oxide, in cylinders, of hydrocarbon gases in "bottles" for domestic heating and lighting. Liquid air is used as a refrigerating agent where extreme cold is needed, as a source of oxygen, which is produced by fractional distillation, and as an explosive. *See* Gas; Thermodynamics.

Liqueur. Aromatic and usually sweetened alcoholic beverage, with various flavourings giving it a distinctive character. Liqueurs generally consist of equal proportions of alcohol and plain syrup

made from cane sugar, mixed with small proportions of essences or herbs. Some, such as Vergyn and Khoogin, contain no syrup, but are mixtures of vermouth, or khoosh bitters, and gin.

Some of the most renowned liqueurs originated in the monasteries, and probably in the early days were used by the monks as medicines; but the secret of their composition has always been jealously guarded. Among the best known are Advocaat, Benedictine, Chartreuse (green and yellow), Cointreau, Crème de Menthe, Curaçao, Drambuie, Grand Marnier, Kummel, and Maraschino. Such liqueurs as apricot, peach, and cherry brandy are made by steeping the various fruits in brandy for a lengthy period, cherry whisky by steeping cherries in whisky, and sloe gin by steeping sloes in gin.

Liquid. One of the three states of matter. It may be defined as matter which is unable to sustain a steady shearing stress, no matter how small that stress may be. Sir Oliver Lodge defined a solid as form and volume, and a liquid as volume without form. In a solid pressure or tension can be applied to produce bending or strain, but in a liquid no such stresses can be applied unless the liquid is confined in some way. It is a fundamental characteristic of liquids that when a certain volume is introduced into a vessel of greater volume it occupies only a portion of the vessel equal to its own volume, in contradistinction to a gas, which fills the containing vessel.

The free surface of a liquid at rest is horizontal and the pressure at any point in the liquid is the same in all directions, depending on the density of the liquid and the distance of the point from the free surface. Most liquids are highly incompressible.

The surface tension of a liquid is due to the attraction of the molecules of the liquid for one another, *i.e.* their cohesive force, and may be likened to an elastic skin over the free surface. Capillarity and the formation of drops, soap bubbles, etc., are the consequence of surface tension forces tending to reduce the surface area and hence the potential energy of a system to a minimum. The calming of rough water by a film of oil is an application of surface tension.

All liquids are viscous to a greater or less degree. If a liquid flows through a rectangular channel, the upper parts flow faster than the lower, *i.e.* every layer of

water may be imagined as sliding over that immediately beneath it. This phenomenon is caused by the internal friction of the liquid, or its viscosity, as it is termed, and it decreases with the temperature and the density of the liquid. The viscous property of certain liquids, *e.g.* oils, is made use of for lubrication purposes.

An important property of many liquids is their power of holding solids, other liquids, or gases in solution to form a new homogeneous fluid medium. This property is closely allied with those of diffusion and osmosis. By diffusion two liquids will slowly mix when introduced into a vessel with the heavier one below and the lighter above, thus acting against the force of gravitation. This process, which is slower the heavier and more complex the molecules, is used to separate one liquid from another through a diaphragm, the lighter molecules diffusing through and leaving the heavier ones on the other side.

In osmosis a solution of sugar, say, can be separated into sugar and water by a diaphragm through which the water only can pass. Osmosis may be defined as the tendency which two fluids of different densities, separated by a closed membrane, have to pass through that membrane. The process is of great importance in nature, plants absorbing dissolved substances from the soil by this means. *See* Hydraulics; Osmosis; Solution.

Liquid Air. Pale blue liquid obtained by compressing and cooling air to below the boiling point of its constituent gases. It consists mainly of liquid oxygen (b.p. -182.9° C.) and liquid nitrogen (b.p. -195.7° C.). The best known machines for making it are those devised on the regenerative process by Hampson in Great Britain and Linde on the Continent. In the Hampson apparatus air at a pressure of 150 atmospheres is allowed to expand through a valve to a pressure of one atmosphere, thereby producing a cooling due to the Joule-Thomson effect. The Linde apparatus differs in that the closed circulating system is at a high pressure, the gas expanding from 150 to 40 atmospheres. The Claude and Heylandt processes are more efficient and depend upon the cooling produced by the performance of external work in an expansion engine.

Liquidambar styraciflua. A gum tree, a large member of the family Hamamelidaceae, also

known as the sweet gum tree. It is a native of North and Central America. It has five- to seven-lobed alternate leaves, much like those of the maples, which are fragrant when bruised, and turn crimson in the autumn. Male flowers appear in a conical cluster, consisting of numerous stamens mixed with minute scales. Female flowers are in a dense head or spherical catkin, consisting of ovaries and styles mixed with scales. The tree exudes a fragrant terebinthine juice, and the wood is fine-grained.



Liquidambar styraciflua.
Foliage and flowers of
the American gum tree

Liquidation. Literally, the act of making liquid. Apart from its scientific uses, the word is chiefly used in connexion with bankruptcy law. Liquidation is the name given to the process of distributing a bankrupt's estate, *i.e.* realizing the assets and paying the money over to the creditors; also to the winding up of joint stock companies. The official in charge of this, generally an accountant, is called the liquidator. The word is sometimes used to mean the payment of a debt. See Bankruptcy; Company Law.

Liquid Measures. Measures of capacity concerned with liquids. In the U.K. the standard is the imperial gallon which was made legal in 1824. It is defined as the measure of 10 lb. of distilled water at 62° F. when the barometer is at 30 ins., and is equal to 277.274 cu. ins. In the U.S.A. the standard is the old Queen Anne gallon equal to 231 cu. ins. The international unit of volume in the metric system is the litre, defined by an international conference in 1875 as being the volume occupied by 1 kilogram of pure water at the temperature of maximum density and under normal atmospheric pressure. There are 4.546 litres in 1 imperial gallon. Originally it was intended that the kilogram should be the mass of 1,000 c.c. of pure water at the temperature of maximum density and under normal atmospheric pressure; in actual fact it is simply the mass of the standard kilogram kept in Paris. Thus, instead of the litre being equal to exactly 1,000 c.c., it is found by experiment to be equal to 1,000.028 c.c. See also Ounce.

Liquorice (Gr. *glycys*, sweet; *rhiza*, root). Peeled root of various species of *Glycyrrhiza*. It is met with in commerce in long cylindrical pieces of a brownish colour. Liquorice has a sedative action on sore throats, and is used as a flavouring agent in mixtures. Both an extract and a powder are used medicinally as a purge.

Lira. An Italian coin, the unit of the country's currency. The plural is lire. Its rate of exchange was fixed in 1945 at 900 to the £. It is divided into 100 centesimi. Before the Second Great War there were nickel-steel coins of 1 and 2 lire, silver of 5, 10, and 20 lire, and gold of 50 and 100 lire. Banknotes were issued of values up to 1,000 lire.

Liria (anc. *Edeta*). A town of Spain, in the prov. of Valencia. Situated on the banks of the river Guadalaviar, about 18 m. by rly. N.W. of Valencia, it has mineral springs in the neighbourhood, and a thriving trade is carried on in wine, esparto grass, and olive oil. Pop. 9,557.

Lirima. Volcano of Peru, in the dept. of Ayacucho. It is a snow-capped peak overlooking the Tarapacá ravine. Alt. 19,128 ft.

Lisbon. Administrative district of Portugal, in the prov. of Estremadura. It is bounded W. by the Atlantic Ocean and E. and S. by the Tagus and its estuary. Mountainous in the interior, it rises in Monte Junto to 2,188 ft.

The chief products are copper, cork, wine, oil, salt, fruit, and fish. Area 1,060 sq. m. Pop. 1,070,103.

Lisbon. City of Portugal. The Portuguese pronounce it approximately Leeshboa. Capital of the republic and of the prov. of Estremadura, it stands on the estuary of the Tagus, about 9 m. from its mouth. The city is built on a series of low hills,

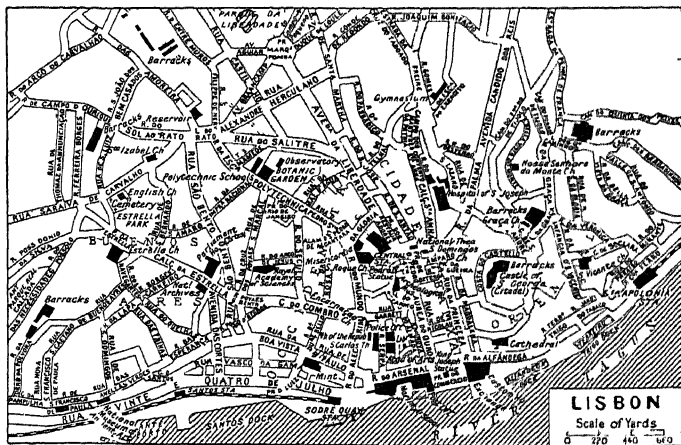


Lisbon arms

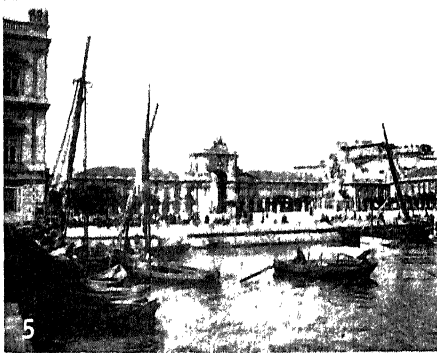
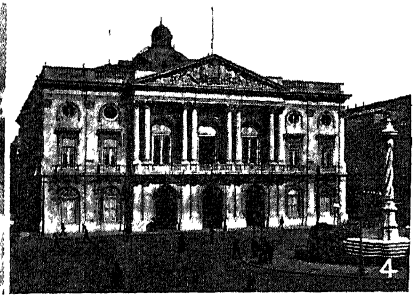
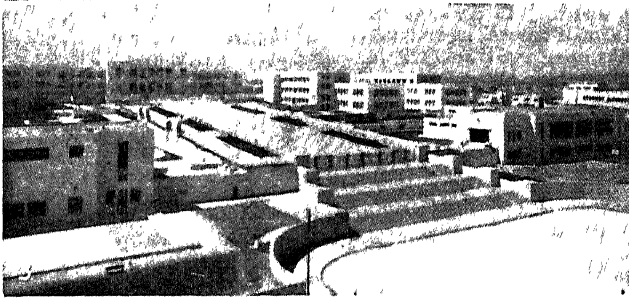
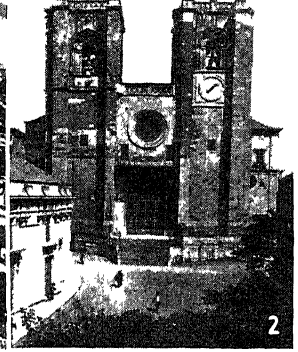
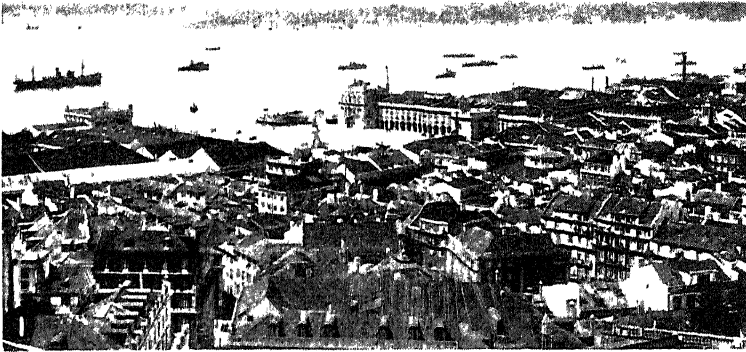
which rise from the banks, and fronts the estuary for a distance of 6 m., presenting an imposing aspect from the sea. The city limits were extended in 1885, taking in the suburbs of Belem, Alcântara, Pedrouços, and Junqueira, and it now covers nearly 50 sq. m.

The city is divided into three parts—Lisboa Occidental, the modern quarter; Cidade Baixa, or lower town; and Alfama, or Lisboa Oriental, the old town. The older portion has steep and tortuous streets, but the newer part is well planned, with spacious streets and boulevards. The Moorish citadel on the crest of one of the eminences, the white houses, numerous churches, palaces and convents, many parks and open spaces, combine to make Lisbon one of the most beautiful cities in Europe. With a mild climate, though a little oppressive in summer, it is a winter health resort and a centre for visitors.

The harbour is one of the finest in the world; it is lined with several miles of quays, fully equipped with hydraulic cranes, docks, warehouses, slips, and rlys. On the S. bank are the government and privately owned docks,



Lisbon. Plan of the capital city of Portugal indicating principal buildings and quays



Lisbon, Portugal. 1. General view of the city showing the Tagus. 2. West front of the Cathedral, rebuilt after the earthquake of 1755. 3. The Polytechnic school, with the Statistical Institute behind, on the right. 4. City Hall. 5. Praça do Comercio, seen from the Tagus, showing the statue of Joseph I, and the triumphal arch. 6. Praça Dom Pedro IV

and a wireless telegraphy station. Half the shipping that enters the port is British as it is a port of call for ocean-going steamers from Southampton to the River Plate and the Pacific ports. Lisbon is the headquarters of the colonial shipping traffic.

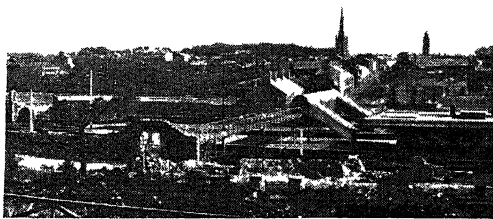
There are 18 museums of art, archæology, ethnology, oceanography, etc. The great earthquake of Nov. 1, 1755, destroyed the greater part of the city and killed 30,000 to 40,000 persons, besides many thousands in other places. It was followed by a destructive tidal wave and a fire. Of the cathedral, founded in 1150, little old work remains. Noteworthy are the 12th century church of S. Vicente, the 13th century

Nossa Senhora do Monte, and the 16th century Nossa Senhora da Graça. The palaces are those of the Necessidades (a former royal residence), that of the cardinal-archbishop, and those of Almada, Foz, and Belem, and the Municipality. There are three academies, two public libraries, eight theatres, an aquarium, a bull-ring, botanical gardens, mineral and medical baths, etc. Distinctive features are the parks and squares; the huge Praça do Comercio is called by the English Black Horse Square, in allusion to the equestrian statue of Joseph I. A magnificent aqueduct supplies the city with water. In 1949 the construction of a city underground rly. was approved. In the English cemetery are the graves

of Henry Fielding and Philip Doddridge.

Lisbon is an important fishing centre, with a large fleet of smacks and trawlers. Among the industries are shipbuilding, sugar refining, and the manufactures of textiles, gold and silver work, chemicals, glass, soap, paper, preserved foods, pottery, small arms, and ammunition. Exports include wine, oil, fruit, fish, cattle, leather, wool, pit-props, and cork. Among imports are coal, petroleum, tobacco, and other colonial produce.

Under the Romans, Lisbon was a municipium, and ranked as the second city of Lusitania; remains of a temple, a theatre, and some baths are the only relics of Roman rule. Captured by the Alans



Lisburn, N. Ireland. General view of the town, with railway station, from the west
Lawrence

and Visigoths, it was wrested from them by the Moors, but was retaken by Alphonso Henry, aided by Crusaders, in 1147.

Replacing Coimbra as capital of Portugal in 1260, the city derived much trade from the discoveries in America and the conquest of India. It speedily became the richest city in Europe, rapidly recovering from the effects of serious earthquakes in 1531 and 1755. The French invasion at the beginning of the 19th century, the removal of the court to Rio de Janeiro, the Peninsular War, and the loss of Brazil brought Lisbon to decline. Revolutions followed, and it was only during the later 19th cent. that it rose again to its present importance.

After the fall of France in the Second Great War, Lisbon became one of the few ports of exit from and entry into Europe. Refugees streamed thither, among them the children of the king of the Belgians, the grand duchess of Luxemburg, ex-Empress Zita, Archduke Otto, and the Belgian statesmen P. H. Spaak and P. van Zeeland. The trans-Atlantic air service had its terminus at Lisbon, which was also the centre of Red Cross activities on behalf of prisoners of war. Pop. 709,179.

Lisburn. City, market town, and urban dist. of Antrim, N. Ireland. It stands on the Lagan, 8 m.



Lisburn U.D. seal

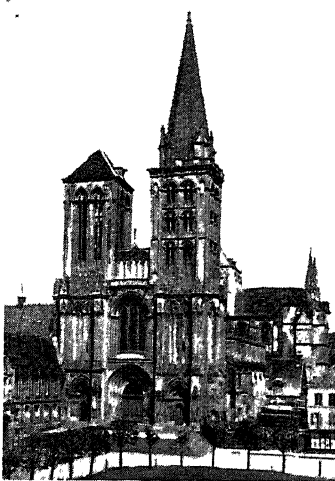
S.W. of Belfast with a rly. station. Here is Christ Church, the cathedral of the united dioceses of Down, Connor, and Dro-more; this contains a memorial to Jeremy Taylor, who was bishop here. The chief industry is the manufacture of linen, with bleach-works and other attendant industries. The city has a castle, the gardens of which are public property. About 1685 some Huguenot refugees introduced the linen manufacture here. Lisburn sent two members to the Irish parlia-

ment, and from 1800 to 1885 one to the English. In 1920 during disturbances here several shops and houses were burnt. Market day, Tues. Pop. 13,042.

Liscard. District of Wirral, Cheshire, England. It is part of

the bor. of Wallasey, between New Brighton and Seacombe. The locality is interesting to the geologist from the presence of a submarine forest. To prevent encroachment of the sea, an embankment was constructed in 1829-44. See Wallasey.

Lisieux. City of France. It stands in the dept. of Calvados, at the junction of the Touques and the Orbiquet, 30 m. S.W. of Rouen. The chief building is the church of S. Peter, the cathedral when Lisieux had a bishop: it is noted for its portal, pulpit, nave, and lady chapel. Most of it was built in the 12th and 13th centuries. The church of S. James is famous for its stained glass and other works of art. The bishop's palace is now used as a museum. The city makes woollen goods and has an agricultural trade.



Lisieux, France. West front of the church of S. Peter

Lisieux was important in the Middle Ages, the Frankish town having developed from the Roman settlement. A fortress, it was first in Neustria and then in Normandy, and changed hands between France and England several times. Its bishopric was abolished in 1802. Henry II was married to Eleanor of Aquitaine in the cathedral. Occupied by the Germans in June, 1940, Lisieux was included in the German-occupied zone after the surrender of France. On Aug. 22, 1944, British troops fought their way into the town, which was cleared of the enemy in two days. Several historic houses were destroyed. Pop. 12,746.

Liskeard. Municipal bor. and market town of Cornwall, England.



Liskeard, Cornwall. Parish church of S. Martin, one of the county's largest churches, from the south
Fritth

It is 15 m. by rly. W.N.W. of Plymouth. The town is situated on hills above the Looe river and not far from Bodmin Moor. The church of S. Martin, one of the largest in Cornwall, is Perpendicular, with a tower rebuilt in 1902. Once with mining interests, Liskeard is now rather an agricultural and sporting centre. It became a corporate town in 1240, and long returned two members to parliament, but lost one in 1832 and the other in 1885. Sir Edward Coke and Gibbon were members for the borough. Anciently called Liskerett, and the site of a castle, it was given by William the Conqueror to one of his followers. Later it passed to the earl of Cornwall. It is the rly. junction for Looe. Pop. 4,300. Pron. Liskerd.

L'Isle. Town of France, in the dept. of Vaucluse. It has a fine situation on the Sorgue, 14 m. E. of Avignon, and is a rly. junction whence tourists go to Vaucluse, 4½ m. to the E. Textiles are manufactured.

Lisle. ALICE (c. 1614-1685). English lady, executed by Judge Jeffreys. She was a daughter of

Sir White Beckenshaw, of Moyles Court, Hants. In 1630 she married John Lisle (1610-64), later one of the regicides. On the Restoration she probably accompanied her husband to Switzerland, and after his murder, 1664, returned to Moyles Court. There on July 26, 1685, she was arrested for sheltering a dissenting minister, John Hicks, who was said to have been concerned in Monmouth's rebellion, though she had no knowledge of it. On Aug. 27-28 she was tried before Jeffreys at Winchester, and was sentenced to be burnt alive. She was beheaded Sept. 2.

Lisle, ROUGET DE. The composer of the *Marseillaise* is entered as Rouget de Lisle, C. J.

Lisle Thread. Yarn used for making hosiery, gloves, and lace. Originally it was a linen yarn made in Lille, but nowadays the term is applied to cotton yarns of good quality, combed, rather highly twisted, and with surface hairiness removed by singeing.

Lismore. Town of co. Waterford, Eire. It is 4 m. W. of Cappoquin, on the Eire state rlys., and rises above the Blackwater, here crossed by a bridge built in 1775. The castle, founded by Prince John in 1185, was destroyed in 1189, besieged 1641-43, damaged by fire 1645, restored by the 2nd earl of Cork, and later by the 6th duke of Devonshire. The property of Sir Walter Raleigh in 1589, it passed to the 4th duke of Devonshire by his marriage with Lady Charlotte Boyle. It commands some of the most beautiful views in the S. of Eire, and in it is preserved the ancient Book of Lismore. The splendid ballroom, with pointed Gothic roof and stained glass windows, was once the chapel. Near by are the cathedral of S. Carthaghy, who is said to have founded the bishopric in 633; a modern R.C. church, a holy well, and a rath or Celtic mound, *Lis Mor* (Great Fort), from which the town takes its name. The beautiful 12th cent. Lismore crosier is in the national museum, Dublin. Pop. 1,474.

Lismore (Gael., great garden). Island of Argyllshire, Scotland. In Loch Linnhe, it is 5 m. N.W. of Oban. It is 10 m. long and 2 m. wide, with an area of 15 sq. m. The inhabitants are engaged in agricultural pursuits and fishing. The chief village is Auchnacrosan. Lismore is famous for its ecclesiastical associations. About 600 a monastery was founded here and about 1200 the island became the seat of the bishop of Argyll. Of the cathedral, erected about that time, only

the choir remains, this being used as the parish church. The Book of the Dean of Lismore is a valuable collection of Gaelic poems written down, 1512-26, by James Macgregor, dean of Lismore. An edition was published in 1862.

Lismore. Port on the Richmond river, in Rous co., New South Wales, Australia. It is 518 m. N. of Sydney, with which it has rly. connexion. It has sawmills, sugar refineries, coal mines, plaster and tile works, and makes clothing, while the neighbourhood produces maize, timber, and sugar, and dairying is carried on. There is a daily steamer service to Ballina at the mouth of the Richmond. Pop. 16,000.

Lis Pendens. Latin term meaning a pending lawsuit. Under the Land Charges Act, 1925, an action relating to land may be registered and thereafter anyone who acquires any interest in the land takes it subject to the claims of the person in the pending action. If the action is not registered, only persons who take the land with knowledge of the proceedings will be affected by them.

Lisping. Substitution of the sound *th* for the sound of the letter *s*. Children tend to make this change, as the *th* is easier to form. Most children grow out of it, but occasionally lisping persists as a habit, which can generally be cured by careful instruction and deliberate pronunciation. See Voice.

Lissa. Island in the Adriatic Sea. The westernmost of the large S. Dalmatian islands, it was formerly Austrian, and is now part of Yugoslavia. Wine, olive oil, almonds, and anchovies are the chief products. The chief towns are Lissa and Comisa, which has a valuable sardine fishery.

Lissa or SAN GIORGIO. Town of Yugoslavia. It is the capital of the Dalmatian island of the same name. Monuments commemorate two naval victories, one of the Austrians over the Italians in 1866 (*v.i.*), and the other of the British over the French in 1811.

Lissa, BATTLE OF. Naval action fought between the Italians and the Austrians, July 20, 1866. An Italian fleet under the count of Persano arrived off Lissa on July 18 with the object of seizing the island. The news was cabled to the Austrian commander-in-chief, Rear-Admiral von Tegetthoff, then at Fasana, and the Italian fleet was still being withstood by the fortifications when, on the morning of the 20th, the Austrians were sighted

Persano had the advantage of heavier and faster ships, which numbered 28 and mounted 641 guns, against Tegetthoff's 26 ships and 532 guns; but he lacked the moral and professional qualities essential to victory. He transferred his flag at the last moment from the *Ré d'Italia* to the *Affondatore*, leaving the bulk of his fleet in ignorance of the change, and the action was begun at 10.43 a.m., without any tactical idea having been conveyed to his captains, and with the certainty that signals would soon be impossible. Tegetthoff gave the order "Armoured ships will charge the enemy and sink him." Thick smoke quickly enveloped the scene and the battle became a disorganized *mêlée* in which ships attacked with ram or gunfire as opportunity offered.

The Kaiser (Austrian) rammed the *Ré di Portogallo* with some success, but suffered heavily from the Italian's guns, while shortly afterwards the *Affondatore* made an ineffective attempt to run her down. After 40 minutes' confused fighting the *Ré d'Italia* lost her steering gear and became unmanageable, and Tegetthoff's flagship, the *Ferdinand Max*, rammed her amidships at a speed of 5 knots, making a breach 300 sq. ft. in extent, and sending the Italian to the bottom almost instantly. This and the Italian *Paestro* were the only vessels lost, but the Italians were thoroughly defeated, and made no further attempt to challenge Austria at sea.

As a result of this action the ram came to be looked upon as the dominant weapon of naval war, whereas in reality it had come into prominence only because of the incapacity of the opposing admirals to make proper tactical use of either their ships or their guns. The ram lost favour as the torpedo and the science of gunnery were developed. See Battleship.

List, FRIEDRICH (1789-1846). German economist. Born Aug. 6, 1789, at Reutlingen, Württemberg, he was largely self-taught, and in 1817 became professor of political science at Tübingen.



Friedrich List,
German economist

Soon he started organized propaganda for the economic unification of Germany. Too democratic, he lost his chair, was sen-

tenced to imprisonment in 1822, but was released on pledge of emigrating to the U.S.A. There he lived as farmer, mine owner, and publisher, built a railway, and finally returned as American consul at Leipzig. He inspired the building of the first German rly. and was the real founder of the Zollverein, or customs union, the basis of the later empire. In his books, *e.g.* *National System of Political Economy*, 1827, List advocated balanced, self-contained economic units, with free trade modified only by protective tariffs for young industries. He shot himself, Nov. 30, 1846.

Listener, *THE*. Weekly periodical published by the British Broadcasting Corporation, primarily as a vehicle for the printing of broadcast talks. Originally designed to implement the B.B.C.'s activities in adult education, it first appeared in January, 1929. Although broadcast talks, selected from the B.B.C.'s home and overseas programmes, supply most of its material, so that the journal can boast an unusually attractive range of "contributors," a percentage of original literary matter is included, *e.g.* reviews of new books and criticism of music and of radio programmes. Other distinctive features are contemporary verse and a wealth of well-chosen pictorial illustration.

Lister, **JOSEPH LISTER**, **BARON** (1827-1912). British surgeon and scientist. Born at Upton, Essex,



Lord Lister,
British surgeon
Elliott & Fry

April 5, 1827, the son of a Quaker, he was educated at University College, London, and took his medical degree in 1852. He then took a surgical post in Edinburgh, became professor of surgery at Glasgow in 1860, of clinical surgery at Edinburgh in 1869, and of the same science at King's College, London, 1877. He retired in 1894.

During the Glasgow period Lister began those remarkable investigations into septic poisoning, then a prolific cause of death in surgical cases, which have completely revolutionised the treatment of wounds. Though he realized from the first that cleanliness above all was necessary in operations, it was not till Pasteur in 1862 announced his theory of fermentation and putrefaction that

Lister saw that the formation of pus was due to bacteria. He turned his attention at once to a method of destroying the bacteria, and the use of carbolic acid as a deodoriser led him to think it would prove a powerful germicide. He carried out researches on materials for absorbent ligatures, drainage of wounds, and antiseptic dressings. The immediate success of his methods and his advocacy of the use of antiseptics undoubtedly marked one of the greatest advances in the history of surgery.

Lister was made a baronet in 1883, a baron in 1897, and in 1902 one of the original members of the Order of Merit. He was president of the Royal Society 1895-1900, and the British Association 1896.

He died at Walmer, Feb. 10, 1912, the title becoming extinct. *See Antiseptics.*

Bibliography. Collected Papers, 1909; Lives, G. T. Wrench, 1913; Sir R. J. Godlee, 1921; Reminiscences of L., Sir H. C. Cameron, 1927; J. L., Father of Modern Surgery, R. Truax, 1947.

Lister, **SIR WILLIAM TINDALL** (1868-1944). British oculist. A distant relative of Lord Lister, he was born Nov. 4, 1868, and graduating from Cambridge in 1892, became a fellow of the Royal College of Surgeons in 1895. Elected to the honorary staff of Moorfields eye hospital, he combined clinical with pathological work. Ophthalmic surgeon to the London Hospital at the outbreak of the First Great War, he took charge of the ophthalmic welfare of the B.E.F. in France, and at the end of the war received the K.C.M.G. From 1919 he was consulting surgeon oculist to the king. Lister did much to improve the technique of eye operations. He died July 7, 1944.

Lister Institute of PREVENTIVE MEDICINE. Institution for furthering scientific research into the causation and prevention of infective diseases of men and animals. It was incorporated July, 1891, under the name of the British Institute of Preventive Medicine. The original funds included donations of £20,000 from the trustees of Richard Berridge, and £10,000 from the Grocers' Company. In 1893 the College of State Medicine was amalgamated with the institute, and in 1897 the premises of the institute in Chelsea Bridge Road, designed by Alfred Waterhouse, R.A., were opened. In 1898 the institute received an endowment of £250,000 from Lord Iveagh, and a further bequest of

£26,000 from the trustees of Berridge. In 1903 the first word of the title was changed to Lister. The institute established near Elstree, Herts, laboratories and facilities for preparing antitoxins and serums.

Liston, **ROBERT** (1794-1847). Scottish surgeon. Born at Ecclesmachan, West Lothian, Oct. 28, 1794, a son of the manse, he was educated at Edinburgh university for the medical profession. In 1818 he became lecturer at the school of surgery there, and in 1835 removed to London as professor of clinical surgery at University College, London. He died, Dec. 7, 1847. Liston is known as a daring and successful operator, the inventor of the Liston splint, and the author of *The Elements of Surgery*, 1831-32, and *Practical Surgery*, 1837.



Robert Liston,
Scottish surgeon
After Count D'Orsay

Listowel. Market town of co. Kerry, Eire. It stands on the Feale, 20 m. N.E. of Tralee, with a rly. station and a local line, Listowel and Ballybunnion. In the time of Henry II a castle was built here. Of this building, said to be the last stronghold in Ireland to hold out against Elizabeth, a gateway and towers still remain. Market day, Friday. Pop. 3,309.

Listowel, **EARL OF**. Irish title borne since 1822 by the family of Hare. William Hare, a member of the Irish parliament, was in 1800 made a baron. An earldom followed in 1822, and the title is still held by his descendants. In 1869 the 3rd earl was made a peer of the U.K. as Baron Hare.

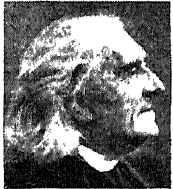
William Francis Hare, 5th earl (b. Sept. 28, 1906), succeeded his father in 1931. From



Eton and Balliol College, Oxford, he entered political life as a Socialist, and was member for E. Lewisham on the L.C.C., 1937-46. He was one of the first to suggest B.B.C. news broadcasts in foreign languages. After holding the post of parliamentary under-secretary at the India office, 1944, he became postmaster-general in

the Labour administration of 1945. In 1947 he held the secretaryships for India and Burma; after these offices lapsed he was minister of state at the colonial office from 1948 to 1950.

Liszt, FRANZ (1811-86). A Hungarian pianist and composer. Born at Raiding, Oct. 22, 1811, he studied under Czerny and Salieri, making his début as a pianist at 9 and appearing in 1822 in Vienna, where his genius was acclaimed. He performed in London, and after his father's



Franz Liszt,
Hungarian musician

death in 1827 settled in Paris, where he met Lamartine, Hugo, and Georges Sand. Inspiration was derived from Chopin and from Berlioz, whose Symphonic Fantastique he transcribed for the piano. From 1833 to 1848, when he ceased to play in public, he was considered the finest pianist of his age. In 1834 he formed an intimacy with Mme. d'Agoult; one of their three children, Cosima, married Wagner. Liszt settled at Weimar with Princess Sayn-Wittgenstein in 1849; here he conducted at the court theatre, composed the pieces on which his fame chiefly rests, and made the town the musical centre of Germany.

His efforts on behalf of Wagner led to the first performance of Lohengrin at Weimar in 1850. Owing to the opposition aroused by his production of Cornelius's Barber of Bagdad in 1859, Liszt resigned his position and retired to Rome, where he became a tertiary of S. Francis of Assisi, receiving the tonsure in 1879. After 1869 he taught in Rome, Weimar, and Budapest. Upon his last visit to England in 1866 he was received with unprecedented enthusiasm and played for the queen at Windsor. He died at Baireuth, July 31.

Liszt's piano technique derived its initial efficiency from Czerny's teaching, but whereas Chopin continued the latter's studies in logical manner, Liszt overthrew every rule and created a technique of elbow and shoulder, demanding of the arms a training hitherto reserved for wrist and hand, and making possible a greatly extended range of keyboard. Many consider him the greatest pianist of all time. His finest works were *Études de Concert*, Paganini

studies, Hungarian rhapsodies, and transcriptions of Beethoven's symphonies, yet the *Liebesträume* are probably best loved. For the orchestra he wrote programme music of a flamboyant nature, e.g. Dante Symphony and Faust Symphony, in which he showed mastery of effect but lack of depth. Later compositions reveal a simplicity and feeling often lacking before. Liszt's life was written by L. Ramann, Eng. trans. 1882; Cosima Wagner, 1912; S. Sitwell, 1934; E. Newman, 1934.

Litany (Gr. *litaneia*, Lat. *rogatio*). Responsive form of supplication and intercessory prayer. The term first occurs in this sense in Eusebius, 339. S. Basil in 379 used it for penitential services. At the close of the 4th century penitential prayers were chanted in church processions in Constantinople. Processional litanies or rogations came into use in Gaul after the earthquakes in the second half of the 5th century. Such litanies, also called processions, were associated with fasting and times of special need. In the Greek Church the term litany is restricted to processions. What is known as the great litany of S. Mark's Day was instituted in Rome by Gregory the Great. The council of Toledo in 694 directed that litanies should be chanted once a month.

The council of Clovesho in 747 decreed that the English Church should observe the three Rogation Days with prayer and fasting, and that litanies should be repeated by clergy and people on S. Mark's Day. Invocations to angels and saints were introduced at the beginning of the 9th century.

The litany drawn up by Cranmer is almost identical with that in the English Book of Common Prayer. It was based upon that of Gregory, the Sarum and York uses, and that by Melancthon and Bucer in Archbishop Hermann's Consultatio. Called The Litany and Suffrages, it was published by royal authority in 1544 and first sung in S. Paul's cathedral next year. Since 1552 The Litany, or General Supplication, as it is termed in the English Prayer Book, has been ordered to be sung or said after Morning Prayer upon Sundays, Wednesdays, and Fridays, and at

other times when it shall be commanded by the ordinary (*q.v.*), as in the communion service, coronation service, ordering of priests and deacons, and consecration of bishops. It includes invocations, deprecations, obsecrations, intercessions, versicles, and prayers. Except in cathedrals, where it is chanted or sung by clergy and choir, the minister leads and the congregation joins in the responses. Like the Lutheran, the English Litany is longer than the Greek, but shorter than the Roman, which still includes invocations to the saints. See Rogation Days; consult New History of the Book of Common Prayer, impr. 1941.

Litchi OR LEE-CHEE (*Litchi*



Litchi. Foliage and flowers;
inset, above, the fruit

chinensis). Evergreen tree of the family Sapindaceae. It is native of S. China. Its leaves are divided into three pairs of lance-shaped leaflets, and the white flowers form a loose cluster. The fruit, about 1½ in. across, consists of a large, dark brown seed surrounded by a sweet white jelly and enclosed in a red, warty rind.

Lit de Justice (Fr., bed of justice). Term used in a special sense from about the time of Louis XI to the Revolution. The custom in France was that new laws in order to become valid must be registered in the parliament of Paris or one of the provincial *parlements*. If a parliament refused, the king often went there in state and ordered the registration to take place. Possibly at first the king actually sat in his bed to do this, hence the name. The last *lit* was held at Versailles, Nov. 19, 1787. *Pron. lee.*

Literary Forgery. Attempt to pass off spurious MSS., letters, etc., as the work of distinguished writers. Solon is said to have put forged letters into the Iliad to further political ends. While some examples of this form of deception fall into the category of legitimate fiction, e.g. the "old ballads" quoted in Scott's novels, some are attributable to misplaced vanity, and some are sufficiently remarkable to have gained merit as original work. Others like the False Decretals (see Decretal) of the 9th century, the authorship of which remains undiscovered, have had a lasting effect on history. Many literary forgeries have given rise to

prolonged controversies. The more common kind, *e.g.* the Parnell letters fabricated by Richard Pigott (*q.v.*), have been produced to make money.

Among notable examples of literary forgery are the medieval History of the Trojan War of Dares Phrygius, which supplied the story of Troilus and Cressida; the poems and histories that Annius of Viterbo ascribed to Archilochus and Fabius Pictor respectively; Psalmanazar's forged descriptions of Formosa; Macpherson's Ossian; Chatterton's Rowley frauds; William Ireland's Voltigern; Simonides' bogus Greek papyri; the so-called letters of Phalaris; Carlo Sigone's Consolation of Cicero; C. J. Bertram's Chronicle of Richard of Cirencester, a monkish description of Britain; William Lauder's efforts to prove Milton a plagiarist; the forged letters of Byron and Shelley; the 27,320 letters forged by Vrain-Denis Lucas in 1861-70; Shapira's Deuteronomy codex; and the spurious first editions of Victorian authors issued during the 1920s by a well-known book-collector, Thomas J. Wise (*q.v.*). See Collier, J.P.; False Antiquities; consult Literary Forgeries, J. A. Farrer, 1907.

Literary Fund. ROYAL London philanthropic society. It was founded, May 18, 1790, by David Williams (*q.v.*), to support deserving authors in sickness or other adversity and to give temporary relief to the widows, orphans, and other relatives of those with any claim on the public from having written any useful book. Williams worked at the project for 16 years before it was realized. The first recipient of relief was Dr. Edward Harwood, but with one other exception, that of Chateaubriand, who publicly acknowledged his indebtedness, the names of beneficiaries have been kept a close secret. Queen Victoria bestowed the distinction of royal upon the fund in 1845. It is supported by donations and subscriptions, and its offices are at Stationers' Hall Court, London, E.C.

Literary Prizes. Awards to authors of works of outstanding literary merit. Except for the Nobel prize, the monetary value of the award is generally not great, the advantage to the author being reaped rather in publicity; for this reason, prizes usually go to young or unknown authors felt to be worthy of wider recognition. The various prizes are noticed in separate entries, *e.g.* Hawthorneden, James Tait Black, John Llewelyn

Rhys, Newdigate, Nobel, Pulitzer, and Stock Prizes.

Literature (Lat. *literae*, letters). Term etymologically comprehending all written expression of thought, but applied particularly to the best written expression of the best thought, and especially to works which possess the artistic quality known as literary style, for which imagination is necessary, as distinct from those which merely aim at recording facts or thoughts. In a still more restricted sense the word is used of the collective body of works written upon a single particular subject.

Literature has been described, somewhat rhetorically, as the immortality of speech, preserving in a body given to it by scribe and printer the unquenchable spirit that prompted the spoken utterance of the originating master mind. Its preservative power is its most wonderful quality, as its decorative beauty is its most pleasing. Relying equally upon the derivation of the word, Quiller-Couch defines literature—the written word—as a permanent record of memorable speech.

Man sets a thing down in ink or print, because he feels it to be memorable and worth preserving. To do this he must choose one of two forms, verse or prose, and the same authority defines verse to be a record in metre and rhythm, prose to be a record which, dispensing with, and indeed abhorring metre, uses rhythm laxly, preferring it to be various and unconstrained, so always that it convey a certain pleasure to the ear. All the subdivisions of literature are distributed between these two forms: verse comprising epic, dramatic, and lyric poetry; prose comprising history, oratory, philosophy, criticism, and, in its latest development, the romance.

All these are treated under their several headings in this encyclopedia, where also are separate articles on the literature of every civilized country, and on the lives of all memorable men of letters. Here, however, the single point may be made that literature as thus defined existed as a perfect whole, compact of perfect parts, in ancient Greece. The epic begins with the Iliad, which remains the supreme example of the epic form. Greek tragedy is the epic recast, with the narrative broken into dialogue and the poet merged in the chorus; dramatic poetry has its supreme example in Aeschylus.

The lyric genius of Tyrtaeus carried the Lacedaemonians to

victory over the Messenians. Herodotus is still acknowledged as the father of history, Demosthenes the perfect orator, Plato the king of philosophers. Aristotle, "himself the subject of all criticism, let down from his heaven of starry thoughts the scales in which his own genius was to be weighed"; with him criticism begins, and to his principles all criticism ultimately returns. As for romance, the Odyssey has been described as a circulating library in one volume, along whose pages all lights and shades of fiction chase each other. Quiller-Couch, commending the patient study of Greek and Latin authors, in the original or in translation, to all students of English literature, does so chiefly because they, in the European civilization which we all inherit, conserve the norm of literature, the steady grip on the essential, the clean outline at which—in verse or prose, in epic, drama, history, or philosophical treatise—every writer should aim.

Upon Greek literature of the classical period, as upon Greek philosophy and art of the same age, no later civilized people has effected any serious improvement. All three remain the standard by which human effort in the same directions is corrected. After the 6th century literature fell on evil days, being considered, when it was considered at all, as a science to be studied rather than as an art. Centuries had yet to pass before a native literature began to appear in France, to be followed later by a native Italian literature.

It was not until the Renaissance revived Greek studies that these later-born European societies were impelled to the attempt to give equally perfect expression to the best thought teeming in their own keen and active intellects, and equally perfect expression in their own tongue. Thenceforward the original pure stream branches off into many currents, various as the personality and national temperament of the peoples through whose countries they run, but all fulfilling the same great purpose of carrying down to future ages all that is best of human thought and activity. See English Language and Literature; France; Germany; Hebrew; Italy; Novel; Poetry.

Literature, ROYAL SOCIETY OF. English society founded by George IV in 1823 for the advancement of literature. It was granted a charter in 1825, but the royal grant of £1,100 guineas a year, which enabled the society to grant pensions of £100 to certain literary men who

were styled royal associates, and included S. T. Coleridge, was discontinued by William IV. The society, the original premises of which were at 4, St. Martin's Place, Charing Cross, has its existing offices at 2, Bloomsbury Square, W.C., and publishes its transactions annually. Fellows of the society have the right to add F.R.S.L. after their names; members, M.R.S.L.

Litharge (Gr. *lithos*, stone; *argyros*, silver). Oxide of lead (PbO). It is formed by the slow oxidation of molten lead, and in preparing it care is taken to keep the temperature of the lead bath below the point at which litharge will melt. The molten metal is rabbled about on the hearth of a shallow furnace and thus exposed to air. The surface of the lead takes up oxygen, forming litharge as a crust of earthy-looking reddish-yellow slag. This is skimmed off the lead, a clean surface is exposed, and the operation repeated until the whole mass has been oxidised. The collected crude litharge or dross is ground between rollers, washed, dried, and sieved. It is an important assayer's flux, and is largely used as a pigment; also as the raw material for the manufacture of red lead (*q.v.*), as a glaze for earthenware, and in the preparation of the commoner kinds of glass. Litharge is also manufactured directly from lead ores. See Lead.

Litherland. Urban dist. of Lancashire, England. It is $4\frac{1}{2}$ m. N. of Liverpool, with a rly. station, and is also connected with the city by overhead electric rly., tram, and bus. Water and electricity are supplied from Liverpool. Pop. 17,710.

Lithgow. Mining township in Cook co., New South Wales, Australia. It is 96 m. by rly. W.N.W. of Sydney, on the Blue Mts. Coal, iron, and kerosine shale are found at Lithgow, which is the site of the chief Commonwealth small arms factory. Pop. 18,850.

Lithiophilite. An end-member of the isomorphous lithiophilite-triphyllite series of minerals. The series ranges from bluish-grey iron lithium phosphate with little manganese (triphyllite) to pinkish-brown manganese lithium phosphate with little iron (lithiophilite). Examples are found in pegmatites and pegmatitic granites.

Lithium. One of the alkali metals and the lightest metal known, with specific gravity half that of water. Although the oxide was discovered in 1817 by

Arfvedson, the metal itself was first isolated in 1822 by Brandes. It is still regarded as a rare metal in spite of its relatively cheap production on a commercial scale and of its use in many non-ferrous alloys. The element, symbol Li, falls next to sodium in the first group of the periodic table. It has atomic number 3; atomic weight 6.94; melting point 180°C. ; boiling point $1,336^{\circ}\text{C.}$; crystal form, body-centred cubic, with lattice constant, $a=3.501$ and an interatomic distance of 3.032 Ångström units; specific gravity 0.534; electrical resistivity 8.4 ohms-cms. at 20°C. ; valency 1.

The chief ores used for production of the metal are mentioned below. It is extracted from the ore by a two-stage process, involving preliminary chemical separation as the carbonate, followed by electrolysis of one of its fused salts, usually the chloride, cyanide, or bromide. The metal thus obtained has a purity of over 99 p.c. and is silver-white in colour. On exposure to damp air it tarnishes rapidly. It is soft, though a little harder than sodium and potassium, and can readily be drawn into wire or rolled. Alloys of lithium and calcium are used instead of phosphorus for deoxidising copper, for

bronzes and for the refinement of graphite in cast irons. The metal itself is a hardener in stainless steels, lead-base bearing alloys, and silver solders. It is used in the ceramic industry, in the manufacture of optical glasses, and as the chloride in air-conditioning plant.

Lithium Ores. The chief are spodumene (lithium aluminium silicate), amblygonite (lithium aluminium fluo-phosphate), and lepidolite (lithium-bearing mica of complex composition). These three minerals commonly occur together in granite pegmatites, often associated with cassiterite, columbite-tantalite, etc. The most famous lithium-bearing pegmatite is worked at the Etta mine, S. Dakota, U.S.A. Pegmatite minerals are characterised by their coarse grain; at Etta spodumene crystals attain lengths of more than 40 ft. weighing over 40 tons each. Other lithium deposits occur at Winnipeg, Manitoba, and in pegmatite veins and dykes in many countries. Occasionally, as at Searles Lake, Calif., lithium has been produced as a by-product from treatment of brine. World production is about 3,000 tons a year, two-thirds coming from the U.S.A.

LITHOGRAPHY: METHODS & RESULTS

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This article describes one method of pictorial reproduction. Articles dealing with other methods include Colour Printing. See also Half-tone; Printing; Photogravure; Process-engraving.

Lithography (Gr. *lithos*, stone; *graphein*, to write) is a process of printing in which the ink adheres to an image on a flat surface, whence it is transferred by contact to paper, or, in the case of offset, by the intermediary of rubber.

The surface, originally a special limestone, is now usually zinc or aluminium. Invented between 1796 and 1798 by a Bavarian printer, Alois Senefelder (1771-1834), the process is the most versatile of all printing methods. It can be broadly subdivided into two processes of application: (1) Chromo-lithography, the parent method in which the image is drawn by hand on to the printing surface, largely used for pictorial posters, coloured labels, and showcards; (2) Photo-lithography, a newer process, whereby the image is produced photo-mechanically on the printing surface; it is used for the reproduction of line, half-tone, and colour work.

In lithography—chromo, photo, and offset—the action is based on

the lack of affinity between grease and water. When the stone or plate upon which the image lies is moistened with a thin film of water, the subject, compounded of a greasy ink, repels the water, which covers only the white spaces; when the plate is afterwards rolled with ink, this adheres to the image, i.e. the plate will accept the greasy ink wherever it is drawn or photographed upon, but repels the ink where it is covered by water.

CHROMO-LITHOGRAPHY. This was the first general method of colour-printing for large quantities. By this process a picture is built up on the plate tint by tint, like the stages of a water-colour painting, until the original is faithfully reproduced, but the reverse way, as a mirror image.

Chromo-lithography consists of three operations. The first is the draughtsmanship upon a key plate drawn by hand, in which all the colours, tints, and solids in the original are provided for in skele-

ton outline. This key is prepared according to the number of printings decided upon, say six, and the skill of the draughtsman manifests itself at this stage, as by his knowledge of colour he so manipulates his combinations that he is enabled by the superimposition of his six tints to produce a print in which ostensibly there appear to be nine or more colours; thus, by printing a blue on a yellow he gets a green, by printing red on blue he gets a purple, and so on.

Six impressions are now taken from this one key plate and transferred or set-off on to six printing plates, one for each colour, and the draughtsmen fill into the skeleton outline the colour intended to be worked on each respective individual plate. The draughtsman's ship upon the six plates consists of (1) solids; (2) chalk drawing; (3) small dots or pencil pricks, termed hand stipple; (4) lines. By the agency of all these, the degrees of light and shade, together with the combinations of colours, are obtained.

Hand stippling is usually replaced by mechanical grained stipples, termed mediums. These save the hand labour of the litho draughtsman. The mediums are manufactured in a variety of forms.

The six plates are proofed, or tested, progressively in their proper sequence, each in its own colour, an impression of the sixth or final plate on the top of the five preceding impressions producing a copy of the original picture.

Production of Large Quantities

Generally large quantities of the subject are required, and it becomes economically expedient to duplicate the work of the draughtsman. This is accomplished in a simple way by taking as many impressions, called retransfers, from each of the six plates as is deemed requisite, using special ink and transfer paper, the retransfers being then impressed in sets on to a large machine plate.

The taking of these retransfers, identically, from the original plates, and the impressing of them in their precise positions and sizes on to the printing machine plates, are operations requiring great care and skill, especially for colour work. The difficulties involved have led to the development of the multi-transferring machine in which the offset principle (*v.i.*) is used to produce machine plates by duplicating from a small original metal plate.

Any number of printing plates can be made, or any number of colour sets, with micrometric accuracy.

The final operation is the printing off in bulk, or machining. The plates, are fitted into a machine of which there are three types—flat-bed, directrotary, and offsetrotary. The first can be used with litho-stone and plates, the second and third exclusively with plates.

Types of Printing Machine

The flatbed machine differs little in its construction from the first made nearly a century ago, and is still found in use, but the rotary—direct and offset—has supplanted it for rapid production and large editions. However, the principle applied to all three as regards printing is identical, excepting that in the case of an offset machine there is an additional mechanical operation.

The six plates of the colour illustration to be reproduced are fitted either to separate machines or, in succession, to the same machine, or, maybe, two at a time to a two-colour rotary offset machine, and adjusted so that each prints in register with the other; thus each printed image falls exactly in the same position on the paper and the successive colours register with each other. When the machine is properly set and then put in motion, each plate is brought mechanically into contact with damping rollers which impart a film of moisture to all the surface not covered by the greasy image. Immediately after damping, the plate is automatically brought into contact with a series of inking rollers fed from a duct. The greasy image on the plate readily accepts this ink, which is repelled by those parts of it which have been covered by the moisture. The plate is next brought into firm and even contact with an impression cylinder between which and the plate the sheet of paper has been fed, either by hand or by an automatic device, and the image is thus transferred by pressure from the plate to the paper.

A rotary machine will produce up to 6,000 sheets an hour. Reel-fed machines will achieve very much higher speeds. For chromolithography and photo-lithography the principle of printing is the same, and the same printing machines are used. It is only in the preparation of the plates that there is any fundamental difference. For both, the offset principle of machining is generally adopted as it has definite advan-

tages for certain qualities of paper and for particular types of subject. There is now little direct litho printing except of posters.

OFFSET. The term offset implies that the printing is not direct. Thus, instead of the impression from the inked plate going direct on to the paper, in offset machines the impression off the inked plate goes on to an intermediary rubber-covered cylinder, which in turn, later in its revolution, transfers the image to the paper. Since the print is reversed on the offset cylinder and again reversed when it is imparted to the paper, the image to be printed offset appears on the machine plate as it is on the final print; that is, the printing plate image is the right way round, not a mirror image, as in all direct printing processes. This is one of the advantages of the offset process, particularly to the artist.

Decorations on tin boxes are produced in this way—the pioneer use of offset printing, which is specially adaptable for rough and hard papers. Treasury and bank notes and other paper script are among numerous examples of offset printing.

AUTOLITHOGRAPHY. The lithographic process lends itself directly to the work of the artist because the printing surface is normally grained, that is, finely roughened, and this grained surface can be worked upon with chalks to give graduated tones. When metal plates are used this graining is done primarily so that the non-image areas of the plate will hold a thin continuous film of water. The direct drawing of an original picture on the plate (or stone) is autolithography. Such drawing direct on the printing surface gives the artist a peculiar freedom which is lost, or which becomes more or less artificial, in a reproduction by an interpreting artist. By autolithography numerous reproductions can be taken direct from the artist's original picture. Outstanding artists have produced by autolithography such work as book illustrations, book jackets, and posters.

PHOTO-LITHOGRAPHY. There are three basic methods for producing images on lithographic surfaces: (a) the image may be drawn directly by hand with brush, pen, or lithographic crayon or chalk on the stone or plate; (b) a transfer may be taken from an original such as an engraved plate, letterpress block, or type, or a drawing may be made with litho drawing ink on transfer paper, and impressed

on the printing surface; (c) the image may be put down on the litho plate by photographic methods or by a combination of photographic and lithographic methods. All these images can be duplicated by retransferring as described under chromo-lithography, but a photo-litho image is usually duplicated photographically on the printing plate by means of "step and repeat" machines. The only handwork required in photo-lithography is in touching-up or improving the functions of the camera or making additions.

Photo-litho Methods

One photo-litho method is to make a photographic negative of the subject and print it, photographically, upon sensitized transfer paper which has been coated with bichromated gelatine; the print is rolled with transfer ink and dipped in water, which absorbs the gelatine, allowing the ink to be removed where no photographic print was made. The transfer is impressed on to a printing plate, which can be duplicated in sets by retransferring on to the machine plate. This method is used for the reproduction of subjects drawn in straight or curved lines, dots, and grain. As it is photographic, the original subject can be reduced or enlarged. Formerly much used for auctioneers' plans and rly. maps, it has come to be used chiefly for putting images down upon litho stone.

Photo-litho direct on the printing plate is used for lithographic reproductions of fine colour prints, magazine covers, and works of art, for which it has superseded chromo-lithography. The ordinary photographic methods, with specially designed equipment, are used to produce a negative of the image to be lithographically printed. The original is placed before the special camera, which must be large enough to produce images of suitable sizes for the printing machines, and the original is illuminated by the strong light from arc lamps. Having arranged the lighting, set a suitable lens aperture and stop, and brought the image to the correct size and sharp focus, the focusing screen is changed for a dark slide in which the sensitive photographic plate has been placed. Wet plate, dry plate, film, and paper are used according to the kind of work. The camera exposure is then made and the plate or film developed in the usual way. A line negative from a line original, such as a pen drawing in black, is produced

thus. If the original contains tonal values, as in a photograph or wash drawing, the half-tone (*q.v.*) process is used.

The cross-line, glass, half-tone screen is inserted in the camera and adjusted at the correct distance a little in front of the photographic plate. Screens of 133, 150, or 175 lines to the inch are those most used for photo-lithography. The passage of light through the openings of the screen breaks up the image on the photographic plate in the camera into a dot formation, ranging from small, regularly spaced dots in the lighter sections of the negative to solid black areas. It is this varied dot formation which produces the tonal effects in the reproduction.

A certain amount of retouching by hand is usually necessary on the photographic plate, and chemical dot reduction is a treatment which corresponds, lithographically, to the fine-etching of letterpress blocks by the photo-engraver.

Reproduction of colour work is more complicated than that of monochrome. Panchromatic photographic plates must be used, and the colours of the original are separated photographically into the number of printings required by placing coloured light filters before or behind the camera lens. If a full-coloured picture is to be printed in four workings, yellow, magenta, blue, and black, four half-tone negatives are prepared separately by blue, green, red, and yellow colour filters respectively (*see Colour Printing*).

Making Plates for Colour Printing

The line or half-tone negatives are then printed down on to the lithographic machine plates. A finely grained printing plate, say zinc, is prepared, and thinly and evenly coated with a solution containing ammonium bichromate and egg albumen or fish glue or other suitable colloid. The colloidal film is spread and dried in a whirling machine. The sensitised, coated plate is fitted into a vacuum printing-down frame, and the negative is placed face down over it in the correct position. Close contact between negative and plate is secured by pumping out the air from the frame, which is then exposed to the intense light from arc lamps. The light passes through the transparent parts of the negative and hardens the light-sensitive colloid film on the zinc plate.

After the exposure, the plate is taken from the printing frame and covered with a film of greasy ink.

Then it is placed under running water and the printing image developed out, as those parts of the colloid film which were protected from light action by the opaque areas of the negative wash away, leaving the light hardened parts of the film retaining the ink and forming the printing image.

The cycle of the photographic operations is modified for the purpose of giving either (a) an offset plate with the image the right way round, or (b) the reversed image required on a direct litho machine plate.

Reproduction of Small Images

For printing small images, such as stamps or small labels, a large number of identical images must be put down in exact positions on a single machine plate. Mechanical appliances have been devised to do this. With one type of step-and-repeat machine a series of exposures can be made on photographic plates, a row of images being exactly spaced and then stepped to another row and the exposures repeated. So accurate are these machines that multiple negatives can be made for printing in different colours and exact register maintained over the whole of the work. Other machines take the negatives and print them down upon sensitised metal, stepping along in repeated lines with the same exactitude. The machine plates produced by any of the methods described are gummed, using gum arabic solution to protect and maintain the non-image areas, and are then ready to be fitted to the printing machine.

Early half-tone printing by offset was lacking in contrast partly because the dot formation of the image was broken up by the grain of the plate. Chemical methods were developed to produce printing plates in which the image is slightly recessed, such deep-etch plates having clearer definition, better dot formation, and more durable printing qualities. Other lithographic printing plates have the image, grease-receptive sections, of a different metal from the non-image, grease-repellent portions. The image is formed on a smooth surface, thereby securing still better definition and dot formation.

Bibliography. Handbook of Lithography, D. Cumming & C. Parkinson, 1932; Lithography as a Fine Art, A. S. Hartnack, 1932; Photolithography and Offset Printing, J. S. Mertle and H. Keusch, 1942; The Technique of Colour Printing by Lithography, T. E. Griffiths, 1945.

Lithopone. Double precipitate of barium sulphate and zinc sulphide. It is produced by calcining barite with coke, giving barium sulphide and barium carbonate, dissolving the former in water, filtering, and adding a solution of zinc sulphate. It is used as a brilliant white, non-poisonous pigment of fine texture. See Barium.

Lithosphere. Name given to the rocky sphere forming the solid earth, whose surface hollows are filled by oceans and lakes (the hydrosphere), and whose exposed parts form the land masses. As the interior of the earth is different from the surface, many scientists limit the word to the outer part or crust, where the rocks resemble those at the surface, and use the terms centrophere, bathysphere, barysphere for the interior. See Earth; Isostasy.

Lithotomy. Operation of cutting (Gr. *tomē*) into the bladder for the removal of a stone.

Lithuania. One of the Soviet Socialist Republics. It is bounded on the N. by Latvia, E. by White Russia, S. by a strip of Poland and the R.S.F.S.R., W. by the Baltic. When admitted to the Soviet Union on Aug. 3, 1940, it had an area of 31,600 sq. m., and pop. 2,879,070.

The country is flat and low-lying. There are many rivers, the chief being the Niemen, and lakes and marshes; about 25 p.c. of the terrain is forest, mostly coniferous. Nearly 77 p.c. of the pop. are engaged in agriculture, the products being cereals, potatoes, flax, and linseed. Poultry farming, particularly of geese, is a considerable industry, as is bee-keeping. Manufactures, which include distilling and brewing, are comparatively small. The chief exports are corn, cattle, hams, poultry, butter, eggs, flax, timber, linseed, wool, and hides. While part of Russia up to 1918, Lithuania had no seaboard, but by award of the arbitration court in 1921 it received from Latvia a strip of coast 15 m. long from the Memel district to 4 m. N. of the Svėnta, and including the roadstead of Polangen. There are about 1,200 m. of rivers, and as many of waterways, connecting the chief towns, Vilna (Vilnius), Kovno (Kaunas), Memel (Klaipėda), and Šavli (Šiauliai), with the Russian and Polish rly. systems.

The Lithuanians are of Aryan stock, closely akin to the Letts, with whom they perhaps came to W. Europe three or four thousand years ago. Lithuanian, of Euro-

pean tongues the nearest to Sanskrit, is the chief language, but many of the people talk Russian and Polish. From 1864 to 1905 the Russian government prohibited the use of the Lithuanian language. Apart from a rich body of songs, poems, and tales, there is no old-time Lithuanian literature, but novelists and poets are forming a new one.

In the 13th century Lithuania became a grand duchy, and in the 14th its people in the mass abandoned paganism. In 1386 the grand duke Jagiello became a Christian and married the Polish queen Jadwiga (Hedwig). King of Poland, he later ceased to be grand duke of Lithuania, the Lithuanians electing as his successor Vytautas (Vitold), 1392-1430, under whom the country reached its zenith, its frontiers extending from the Baltic to the Black Sea.



Lithuania. Map of this country, one of the Soviet Socialist Republics. It was admitted into the Soviet Union, Aug. 3, 1940.

Polish influence increased in Lithuania, and in 1569 the people were forced to make a union with the Poles at Lublin; but they retained their own laws, courts, and army. Both countries had the same king, but each its own parliament. When they were finally dismembered, Lithuania passed to Russia in 1776; from 1797 it was divided into provinces.

During the First Great War the Germans in 1915 occupied the provs. of Kovno, Vilna, and Suwalki, which, with part of Grodno, were generally known as Lithuania. They were hated by the inhabitants, who in 1917 chose a state council to demand complete independence. At Brest-Litovsk the Bolsheviks recognized the right of self-determination, and on Feb. 16, 1918, Lithuania proclaimed its independence. As the German hold on the country relaxed, on Nov. 11 a provisional national government was estab-

lished. But the Bolsheviks occupied Vilna on its evacuation by the German troops, and advanced towards Kovno, near which they were defeated by the Lithuanians in Jan., 1919. The country also suffered at the hands of the Russo-German force which had been beaten back from Riga by Letts and Lithuanians.

A constituent assembly in May, 1920, ratified the proclamation of independence. Peace was signed at Moscow with the Soviets on July 12; the republic of Lithuania was recognized, boundaries were fixed, the Soviets agreed to pay more than £300,000 to Lithuania. With the Poles an armistice was arranged, but suddenly Żeligowski, commander of the White Russian div. of the Polish army, seized Vilna. For years negotiations concerning its future took place, and it finally

was given to Poland, while in 1923 Lithuania acquired the Memel territory.

In 1939 Russia made demands on Lithuania for naval and air bases. The two countries signed a mutual assistance pact, Lithuania receiving Vilna, which had been taken from the Poles by the Russians. In 1940 Russia presented Estonia, Latvia, and Lithuania with an ultimatum demanding a change of government and free passage for Soviet

troops; in Aug. the Baltic states became Soviet republics. A German army in 1941 advanced through Lithuania and Latvia on Leningrad; Vilna and Šiauliai were taken on June 27, Kaunas three days earlier; the Russians evacuated the country. In the early summer of 1944 the general Russian offensive swept into Lithuania, Vilna being regained on July 13 and Kaunas on Aug. 1. By Oct. 10 the spearhead of the Russian advance had reached the Baltic N. of Memel, which was captured from the Germans Jan. 28, 1945. See Russo-German Campaigns. Consult Lithuania, E. J. Harrison, 1928; A Wayfarer in Estonia, Latvia, and Lithuania, E. C. Davies, 1937.

Litmus. Colouring matter prepared from various species of lichens, of the genera *Rocella*, *Variolaria*, *Lecanora*, which are also employed in the manufacture of archil. It is made by allowing these lichens to ferment in the

presence of ammonia as in the manufacture of archil, but potassium or sodium carbonate is also added, which has the effect of modifying the product so that azolitmin, the colouring principle of litmus, is formed. The action of acid on azolitmin produces a red colour which is turned blue by alkali, and *vice versa*. The chief uses of litmus are as a colouring matter for wine and vinegar, and in analytical chemistry.

Litomerice. Czech name for the town called in German Leitmeritz (*q.v.*).

Litre. Measure of capacity in the metric system. It is both a dry and a liquid measure, and contains one cubic decimetre. The litre equals approx. 1.76 pints. See Liquid Measures; Metric System.

Litter (Fr. *lit*, a bed). Name given to a seat or bed made to be carried. It is usually closed by curtains and carried on poles by bearers. The litter was used by the Greeks and Romans, and in the East, also in Europe in the Middle Ages, and from it the sedan chair developed. Sometimes a litter was made so that it could be drawn by a horse.

Litter (O. Fr. *litière*, bedding). Loose material used for the bedding of stock. It secures their cleanliness and comfort, afterwards playing an important part on the land as a constituent of farmyard manure. Straw, preferably chaffed, is the commonest and probably the best form, that from wheat being the best, while oat straw comes next. Barley is an undesirable form of litter, for the awns cause irritation to the skin. Peat litter is distinguished for its antiseptic properties, but requires frequent changing, as it becomes damp from the absorption of urine. It also decays very slowly when added to the soil, and must not be used for pigs, as they devour it. Bracken is sometimes used, where plentiful. See Agriculture; Cattle.

Little Assembly. Name given to the interim committee of the United Nations assembly set up to assist and advise that body. Consisting of one representative of each member state, it was proposed by the U.S.A. to the political and security committee Sept. 26, 1947, and approved Nov. 6 by 43 votes to 6, Czechoslovakia, Poland, Russia, the Ukraine, White Russia, and Yugoslavia opposing. The assembly approved its creation on Nov. 14 by 41 votes to 6, the same countries opposing and six others, the Arab group, abstaining. At its first

meeting on Jan. 5, 1948, its six opponents were absent; it elected the Mexican representative chairman, the Belgian vice-chairman, and appointed a sub-committee to consider rules and procedure.

Littleborough. An urban district and market town of Lancashire, England. It stands on the Rochdale Canal, 3½ m. N.E. of Rochdale, having rly. connexion with Rochdale and Todmorden. It engages in tanning and industries connected with cotton, woollens, and artificial silk. The water supply is piped from Rochdale. Pop. 12,028.

Little Dorrit. Charles Dickens's tenth novel. It was first issued in monthly parts (Dec., 1855–June, 1857), with illustrations by Phiz. The work, one of Dickens's least popular, is memorable for its indictment of British officialism, as embodied in the Tite Barnacles of the Circumlocution Office (*q.v.*), and its description of the old Marshalsea (debtors') prison in the Borough, and also for a certain touch of cynicism from which Dickens's satire was usually free. William Dorrit, the Father of the Marshalsea, is a masterly example of character drawing; and "Mr. F.'s aunt" is one of the author's memorable grotesques. Other characters include Flora Finching, a character somewhat cruelly based on Dickens's own early love, Maria Beadnell, whom he had re-encountered as a middle-aged woman just before writing this book.

Little Egypt. Name formerly applied to a district in Epirus, Greece, inhabited by people popularly known as Egyptians and ancestors of the Gypsies (*cf.* Span. *Gitanos*). The name is probably due to mistaken etymology, although in the 17th century the Turkish sultan Ahmed bore the title of ruler of the Greater and Lesser Egypt. The Gypsies' tradition that they were expelled from their country by the Turks lends some colour to the belief that they once inhabited Albania. The Scottish Gypsy, John Faw, in 1540, received privileges from James V as earl of Little Egypt. See Gypsies.

Little Englanders. Name used by imperialists about 1890–1910 as a term of opprobrium to describe those who opposed expansion of the British Empire.

Little Entente. Political alliance between Czechoslovakia, Yugoslavia, and Rumania, created after the First Great War. Each of these three nations had suffered oppression under the Austro-

Hungarian empire, and from 1848 protests had been made by the Slovaks, Serbs, Croats, and Rumanians. With their liberation after the First Great War, the three new states, under the driving force of Benes, Czech foreign minister, bound themselves by a number of treaties in 1920–21 to aid one another in the event of unprovoked attack by Hungary. When attempts were made to restore the Hapsburgs in that country, they were frustrated by armed resistance on the part of the Little Entente.

Its aims were not purely defensive. Czechoslovakia took the lead in negotiating treaties with the surrounding countries, and initiated measures for the financial reconstruction of Austria and Hungary. An agreement in 1922 provided for recognition by Czechoslovakia and Yugoslavia of treaties signed by the former with Rumania, Austria, and Poland, and by the latter with Rumania and Italy, for economic, financial, and transport cooperation, and for mutual support in their international relations. In 1938 an agreement signed at Bled between the Little Entente powers and Hungary guaranteed mutual non-aggression between the parties on condition that Hungary's right to rearm was recognized.

The Entente played its part in preserving the *status quo* as long as it was backed by France. With Nazi economic infiltration into the Balkans and Louis Barthou's assassination, 1934, it began to decline, and in 1938 failed to support Czechoslovakia against Hitler's territorial claims. Yugoslavia was apprehensive about Italy, Rumania about Russia. With the German occupation of Prague, 1939, the Entente came to an end.

Little Falls. City of New York, U.S.A., in Herkimer co. Situated on the Mohawk river and the Erie Canal, it is 20 m. E.S.E. of Utica, and is served by rlys. The river, which here has a fall of 45 ft., supplies water-power for the city's industries. These include the manufacture of knitted goods, hosiery, cotton yarn, leather, and bicycles. In the 19th century this was the biggest cheese market in the country. Settled in 1782, Little Falls was incorporated in 1811 and became a city in 1895. Pop. 10,163.

Littlehampton. A seaport, watering-place, and urban district of Sussex, England. It stands at the mouth of the Arun, 62 m.

S.S.W. of London and 18 m. W. of Brighton, with a station on the electrified rly. It has golf links and good bathing facilities. The port does a general shipping trade. The U.D.C. maintains a ferry over the Arun, which here enters the English Channel. Pop. 12,500.

Little John. One of the outlaw band under the leadership of Robin Hood (*q.v.*). The prefix little is no doubt ironical, for he is supposed to have been unusually tall. What is traditionally known as Little John's Grave is in the churchyard of Hathersage, Derbyshire, and a gigantic bow supposed to have been his still hung in the church in the early 17th century.

Little Masters. A name often given to the Dutch *genre* painters of the 17th century, *e.g.* Adrian Brouwer, Gerard Dou, Nicolas Maes, Gabriel Metsu, the van Ostades, Jan Steen, Gerard Terborch. Their pictures, being intended for the walls of the private houses of Dutch burghers, rather than for churches or palaces, are small in size and familiar in subject matter, in contrast to the large decorative paintings of the Italian and Flemish masters, yet in technical achievement they bear comparison with those larger and more ambitious works. See Dutch School of Painting.

Little Minister, THE. Novel by J. M. Barrie, published 1891. It tells with sentimental humour the conquest of the young minister of the Auld Licht Kirk by a seeming gypsy girl who turns out to be an earl's daughter. Barrie adapted the story as a play, produced at the Haymarket Theatre, London, 1897, with Cyril Maude and Winifred Emery in the leading parts.

Littleport. Town of Cambridgeshire, England. On the Ouse, it is 5 m. N.N.E. of Ely, and has a rly. station. The chief building is St. George's church, an old edifice with a fine tower. The town is the centre of a prosperous agricultural dist. in the fenland. Pop. 5,000.

Little Rock. City of Arkansas, U.S.A., the capital of the state and the co. seat of Pulaski co. Situated on a rocky eminence about 50 ft. above the Arkansas river, it is 130 m. W. by S. of Memphis, Tenn., and is served by the Rock Island and other rlys. The river at this point is crossed by four bridges, three of them carrying rlys.

Little Rock is the seat of Philander Smith, Arkansas Baptist, and Shooter Colleges. It contains, in addition to the capitol, a U.S. court house, and various state institutions. Here also are the law

and medical departments of Arkansas university. An extensive trade in lumber, cotton, and bauxite, mined in the locality, is carried on, and the industries include foundries, machine shops, and cotton, furniture, and ice factories. Industrial plants number 125 and the average annual value of manufactures is 20 million dollars. The clear smokeless air of the city is due to the use of natural gas in homes and factories. About a quarter of the inhabitants are negroes; they have four educational institutions. Settled in 1813, Little Rock was incorporated and appointed the state capital in 1821, and became a city in 1836. Pop. 88,039.

Littlestone-on-Sea. A village and seaside resort of Kent, England. It is in the parish of New Romney, and 8 m. S.W. of Hythe, with a rly. station. There are golf links. See Romney.

Little Theatre. Former London playhouse, in John Adam St., W.C.2. Opened Oct. 11, 1910, under the management of Gertrude Kingston, it was one of the first of London's small theatres to present plays not usually seen on the commercial stage. The theatre was virtually destroyed by German bombs in the Second Great War.

Little Theatre. A movement described by the adult education committee of the board of Education (constituted 1921) as "quite essential for the advancement of the drama in the poorer London boroughs and in urban areas generally," also as providing "an intimate atmosphere which is most favourable for delicacy of playing." The term means much the same as repertory theatre (*q.v.*) and refers to the organization that produces plays for a limited audience.

The Little Theatre Guild of Great Britain was inaugurated in 1946, to promote cooperation between the theatres constituting its membership, to maintain and further the highest standards in the art practised by little theatres, and to assist in and encourage the establishment of similar theatres. In 1947 its members were Bradford Civic Playhouse; Crescent Theatre, Birmingham; Crompton Stage Society, Shaw, Lancs; Village Players, Gt. Hucklow, Derbyshire; Highbury Little Theatre, Sutton Coldfield; Leamington and Warwick Dramatic Study Club; Leicester Drama Society; Maddermarket Theatre, Norwich; Newport Playgoers' Society; People's Theatre, Newcastle-upon-Tyne; Questors, Ealing; Stock-

port Garrick Society; Unnamed Society, Manchester. Exchanges between little theatre groups in Great Britain and those abroad are arranged by the guild, the first contact of this kind being in 1946 with the Netherlands Amateur Theatrical Union.

Littleton, SIR THOMAS (c. 1410–81). English jurist. Born at the manor house, Frankley, Worces,



Sir Thomas Littleton,
English jurist

he was the son of Thomas Westcote and his wife, heiress of Thomas de Littleton of Frankley; to this estate he succeeded, taking his grandfather's name. He became a lawyer in London, and was made recorder of Worcester, a serjeant-at-law, and a justice of assize. In 1466 he became a judge of the court of common pleas, and he died Aug. 23, 1481, being buried in Worcester cathedral. From him are descended the families of Lyttelton and Littleton. His great Treatise on Tenures, 1481, started the systematic study of the English law of real property. Of the commentaries on it the most noted is that of Coke (*q.v.*).

Little Women. A story for children by the American writer Louisa May Alcott (*q.v.*). First published in 1868–69, it became famous on both sides of the Atlantic, quickly attaining the rank of a children's classic. A simple family story of the activities of four sisters, each with a clearly defined personality, Meg, Jo, Beth, and Amy March, it was largely a picture of her own early family life in Concord, Mass. Jo was a self-portrait, and the three sisters were her own sisters. Sequels were Good Wives, 1871, which proved almost as popular; and Jo's Boys, 1886. A dramatised version of Little Women was produced at the New Theatre, London, 1919; and film versions were seen in 1934 and 1950.

Littoral (Lat. *litus*, shore). Term used to indicate a coastal district; *e.g.* the Aden littoral refers to the S.W. coast of Arabia. A littoral zone is the margin of the sea where the marine organisms are confined to coastal types. Littoral deposits are sands, gravels, muds, etc., deposited along the coast between high and low water marks. These materials have either been derived from the erosion of the coast or been

transported to the sea by rivers. See Coast.

Littoria. Province of Italy. It was constituted on Dec. 18, 1934, and comprises parts of the provs. of Rome and Frosinone, together with the whole of the reclaimed Pontine marshes area. The province was occupied by British and U.S. troops when forces at the Nettuno bridgehead linked up with U.S. troops advancing from the S., May 25, 1944. The capital had the same name until in 1945 it was renamed Latinia. Pop. approx. 220,000.

Littre, MAXIMILIEN PAUL ÉMILE (1801-81). French philosopher, lexicographer, and politician.



Émile Littré,
French philosopher

He was born in Paris, Feb. 1, 1801. After the revolution of 1830 he became a municipal councillor of Paris, but retired in 1848. He was elected in 1871 a member of the National Assembly, and attached himself to the republican Left, later being a senator. A great linguist, he is famous for his Dictionary of the French Language, on which he spent thirty years up to 1873. As a philosopher, next to Comte he was the chief representative of the Positivist school, although he disagreed with its mystical doctrines. His chief medical work was an edition and translation of Hippocrates, 1839-62. Elected in 1871 to the French Academy, and a life senator in 1875, he died June 2, 1881.

Littrow Mounting. Type of spectrograph mounting, which makes use of one 30° prism instead of the older 60° prism. Most large modern instruments in spectrographic analysis use it, as the



Littrow Mounting. A, Motion of prism; B, 30° prism; C, Mirror back; D, Collimator lens; E, Light source; F, Lens; G, Spectrograph slit; H, Right-angled prism; I, Tilt of plate; J, Photographic plate

length of the instrument is halved, without affecting the path of the light or the dispersion of the spectrograph. Light from the source (see fig.), after passing through the spectrograph slit, is completely deflected by a right-

angled prism. After passing through a collimator lens, it travels through the Littrow prism and is reflected by the back face, which is mirrored by applying an aluminium or tin amalgam. It then travels back through the collimator to the photographic plate in the camera. The adverse effect of certain optical properties of the quartz used in making the prism are overcome. By rotating the prism and tilting the plate, different parts of the spectrum can be photographed. See Spectrograph; Spectroscopy.

Liturgical Colours. Term for the colours of ecclesiastical vestments and altar coverings, which vary with the seasons of the ecclesiastical year. In the Middle Ages, save at Rome, there was great variety in the colours, not only in different countries but in different cathedrals and churches in the same country. Various shades of blue, green, and red, together with pink, yellow, and brown, were used.

The Roman sequence, observed by most Anglican churches, is white for festivals of Our Lord, the Virgin Mary, and saints who were not martyrs; red for Whitsun and the festivals of martyrs; green during the season after Pentecost, and in the Anglican after Epiphany; violet for Advent, Lent, vigils, Ember days and litanies, though many Anglican churches use blue instead; black for Good Friday and ceremonies of the dead. In some Anglican churches the English late medieval sequence is followed, in which red and white predominate together with white canvas with sparsely coloured edges for Lent. Consult Introduction to English Liturgical Colours, St. John Hope and Atchley, 1920; Ceremonies of the Roman Rite Described, Fortescue and O'Connell, 1943.

Liturgy (Gr. *leitourgia*, public service). In ancient Athens, the name of certain public services, the expenses of which had to be defrayed by the wealthier citizens. These services were ordinary and extraordinary. The chief of the former, which were incumbent on all citizens possessed of more than three talents (£700), were: (1) *architheoria*, superintendence of the sacred embassies (*theoriae*) sent to the great national festivals; (2) *choregia*, equipment of the chorus at dramatic and musical contests; (3) *gymnasiarchia*, training of competitors for gymnastic contests, especially the torch races. Of the extraordinary services the most

burdensome was the *trierarchia*. This involved fitting out a trireme, keeping it in repair for a year, and supplying the crew, part of the incidental expenses being defrayed by the state. The arrangements in regard to the *trierarchia* varied at different times. Whenever anyone considered that a citizen richer than himself had been passed over, he could challenge him to an *antidosis* or exchange of property to settle the question.

Liturgy. Proper name for the form, order, or office of the administration of the Holy Communion. The Greek word, which was adopted by the Alexandrian translators of the O.T., corresponds to the Hebrew *Abodah*, used for the priestly ministrations in temple and tabernacle. Commonly applied in the 4th century to priestly ministrations in the Christian churches, it was used particularly for the Eucharist.

Liturgies appear to have developed from apostolic usage into five distinct types: 1, the Eastern liturgy of S. James, Antioch, or Jerusalem; 2, that of S. Mark, or Alexandria; 3, that of S. Peter, or Rome; 4, that of S. John, or Ephesus; and 5, that of S. Thaddeus, used by the Nestorian or Chaldean Christians of Mesopotamia. Upon 1 were based the liturgies called after SS. Basil and Chrysostom, forming the groundwork of the Greek, Russian, Armenian, Syriac, and Monophysite liturgies; upon 2, the Egyptian liturgy; upon 3, the Ambrosian liturgy and that of the Church of Rome; upon 4, the Gallican of France and Spain, including the Mozarabic; and out of 4, as amended by S. Augustine, grew the "use" of Salisbury or Sarum, which, in turn, became the groundwork of the liturgy of the English Reformation. In a wider sense, the word liturgy is used for any form of public worship, such as all those in the Book of Common Prayer. See Missal; Sacramentary; consult Early History of the Liturgy, J. H. Srawley, 1947.

Litvinov, MAXIM MAXIMOVICH (b. 1876). Russian diplomatist. Of Jewish origin, he was born July 17, 1876, at Bialystok, then in Russian Poland. After an active revolutionary career under the tsarist régime, he was appointed diplomatic agent to the U.K. on the outbreak of the Bolshevik revolution in 1917. Arrested as a hostage for British persons imprisoned in Russia, he was exchanged. He married an Englishwoman, Ivy Low, 1916.

Litvinov represented his country at many international conferences and presided over that on disarmament at Moscow in 1925. Commissar for foreign affairs from 1930, he embarked on diplomacy of vital service to the Soviet Union and significant for the world. Non-aggression pacts were signed with the Baltic countries, France, and the Little Entente; British embargoes were lifted on Russian goods; American recognition of the U.S.S.R. was secured. Litvinov was dismissed from office in 1939 and expelled from the Communist party early in 1941, but returned to favour after the German invasion of Russia. He went as ambassador to the U.S.A. in Nov., being replaced by A. Gromyko in 1943. Then he was deputy commissar for foreign affairs until dismissed again in Aug., 1946.



M. M. Litvinov,
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Livadia. An estate on the S. coast of the Crimea, R.S.F.S.R. It lies 3 m. S.W. of Yalta. Once the property of the tsar, it contains two palaces with splendid gardens full of exotic plants, and parks and vineyards. Long the favourite summer resort of the former imperial family, it was also the habitation of wealthy nobles. Here Alexander III died. In 1945, at the Yalta conference, Marshal Stalin met at the New Imperial Palace here Winston Churchill and Franklin D. Roosevelt.

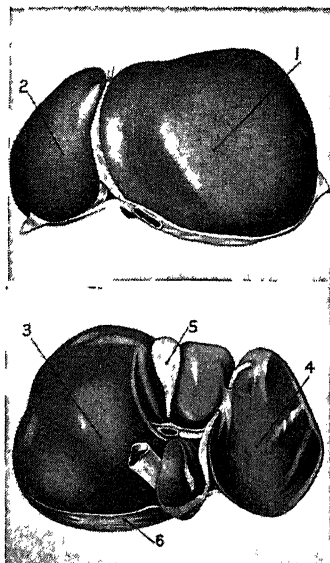
Liver. Largest glandular organ in the body, of paramount importance therein. Its average weight in an adult is about 3 lb. The liver is situated beneath the diaphragm or large horizontal muscle, which divides the body into two parts. The bulk of it is on the right side, protected by the ribs, but a part stretches across the middle line into the left side. The under surface of the organ is in contact with the stomach, intestines, and right kidney. Five ligaments hold the liver in its place. The organ is divided into right and

left lobes, the right being the larger, and sub-divided into three smaller lobes. On the under surface is a deep depression or fossa, in which is lodged the gall bladder.

The liver receives blood from the portal vein and hepatic artery; the blood from it is passed into the inferior vena cava by the hepatic veins. The organ is made up of small oval parts or lobules, each about one-twentieth of an inch in diameter, which, in their turn, are composed of liver cells, in which the blood-vessels and bile capillaries ramify. The small bile vessels are collected into larger channels, and eventually one from each of the right and left lobes unite to form the hepatic duct, which issues from the under surface of the liver. Here it joins the cystic duct from the gall bladder, and the two, forming together the common bile duct, open into the duodenum. Important functions of the liver are the secretion of bile (*q.v.*), and the formation of glycogen.

Glycogen is stored in the liver and passes out into the blood-stream as the muscles need it for their activity. The liver plays an all-important part in the metabolism of fats in the body, and has

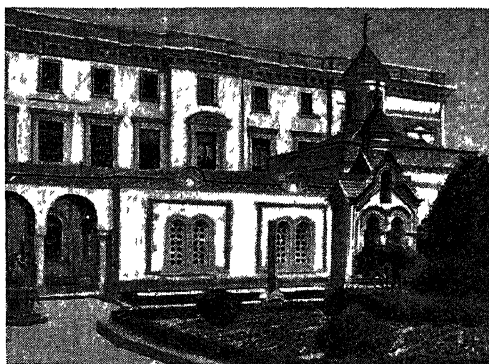
vomiting, and haemorrhages into the skin. The liver becomes markedly reduced in volume. No treatment has any influence on the disease, death occurring in from 2 to 40 days.



Liver. Diagrams of upper and lower surfaces of the human liver. 1. Right lobe, upper surface. 2. Left lobe. 3. Right lobe, lower surface. 4. Left lobe. 5. Fundus of gall bladder. 6. Rough surface of the liver

Cancer of the liver may occur as a primary disease, or more frequently as the result of transmission of the disease from a cancerous growth in some other part of the body. Intractable dyspepsia is an early symptom. Later, the growth may press upon the blood-vessels, causing interference with the circulation and dropsy of the abdomen. The disease is always fatal; the most that can be done medically is to treat the symptoms and relieve the pain with morphia.

Cirrhosis of the liver is due to chronic syphilis, or to circulating toxins. There is an increase in the fibrous tissue, which generally produces degeneration of the cells, and fatty changes may occur with enlargement or shrinking of the organ. From its appearance the condition is sometimes known as gin-drinker's or hobnail liver. Early symptoms are dyspepsia, nausea, and vomiting. Dropsy may appear in the abdomen and feet, while the heart and kidneys frequently become involved. Incidentally, the horse and other animals may also suffer from this condition.



Livadia, Crimea. Garden front and chapel of the New Palace, once an imperial residence, and in 1945 the scene of the Yalta conference

functions as yet not fully understood in determining health. Some controlling factor exists in the liver which checks haemorrhage; and it is this organ which filters out intricate protein bodies resulting from the digestion of food which if present in the blood-stream may produce migraine or asthma.

DISEASES OF THE LIVER. Abscess of the liver may arise from several causes, but is most frequently a complication of dysentery. Acute yellow atrophy of the liver is a rare disease, the cause of which is unknown, characterised by jaundice, severe constitutional disturbance,

Acute streptococcal attack on the liver is fairly common, resulting in fever, loss of appetite, and jaundice. Treatment consists in careful nursing and administration of fluids and glucose until the liver function is restored.

LIVER EXTRACT. The fundamental observation in 1926 by Minot and Murphy, of Boston, Mass., that a diet of lightly cooked fresh liver is efficacious in the treatment of pernicious anaemia ranks as an epoch-making event in the history of medicine with the discovery of insulin (a discovery made just in time to save Minot's life). Twenty-four cases of pernicious anaemia—a disease previously regarded as almost invariably fatal—were given a liver diet (200 grammes daily) with remarkable remission of symptoms. Today few patients are kept on such a diet, but are given standardised liver extracts either by mouth or by injection. Liver does not cure pernicious anaemia, but merely supplies a substance the lack of which causes the disease. Treatment continues for life.

Liver Fluke. Species of trematode worm parasitic in the liver

of various ruminants, chiefly sheep, and occasionally found in man. In sheep it causes "liver-rot," a disease responsible for great mortality and prevalent in damp localities. The liver fluke is flat and leaf-shaped, an inch long. Its life history is complicated. Shelled eggs, liberated with the excrement of diseased animals, hatch after a few weeks into small free-swimming larvae, if water be available. These die unless they reach their next host, a small fresh-water snail, *Limnaea truncatula*, into which they bore. In the snail's body they develop, changing their form several times and multiplying actively.

Eventually small tailed larvae emerge from the snail and become encysted on grass. Eaten by sheep, the parasites emerge from their cysts and make their way into the sheep's liver where they become sexually mature. The life cycle then starts all over again. Sheep should be prevented, if possible, from grazing near ponds which harbour the snail. To combat liver-rot, one of the most important substances is carbon tetrachloride.

home of the century-old Liverpool Philharmonic society, was completed in 1939; visiting musicians regard it as one of the finest concert halls in Europe.

Below St. George's hall, a notable group of buildings is formed by the library, museum, and Walker art gallery. The Liverpool picture collection is probably the most important in England outside London. The hall of the 18th cent. Bluecoat school in Church St. is used for monthly art exhibitions. The museum, famous for its shipping gallery and its excellent archaeological and natural history collections, was badly damaged by enemy bombs in 1941.

Port Facilities

Liverpool has a larger export shipping trade than any other British port and ranks second only to London for imports. In 1947 Liverpool's ocean-borne commerce was valued at £880 million out of the national total of £2,983 million. The Mersey docks and harbour board, created by act of parliament in 1858, controls almost all the docks of the port. The Liverpool system comprises 65 wet docks with a river frontage of over 7 m., a water area of 475 acres, and 29 m. of quays. The Birkenhead docks on the S. side of the river have a water area of 172 acres with 10 m. of quays. The largest dock is the Gladstone at the N. end of the Liverpool dock estate. This can accommodate ships up to 70,000 tons and includes one of the largest dry docks in the world. The ocean passenger traffic is still an important part of the port's activities and there are regular sailings to all parts of the world. Passengers usually embark and disembark at the landing stage, the main feature of the pier head at the centre of the city. The landing stage is half a mile long and about 80 ft. wide. It is supported on pontoons and connected with the pier head by a number of roadways hinged to allow the stage to rise and fall with the tide. Ocean-going liners use the N. end of the stage, the remainder being reserved for the busy cross-Mersey ferry traffic. A full-scale radar system assists the pilotage of ships entering the Mersey in conditions of bad visibility. Since early in 1947 the cross-river ferry boats, which can each carry over 2,000 passengers, have been directed by radar whenever fog threatened to interfere with schedules.

Liverpool's industries include ship repairing, flour milling (Merseyside is the biggest grain-milling

LIVERPOOL: A MAJOR BRITISH PORT

J. P. Phoenix, D.P.A., Municipal Information Officer, Liverpool

The ancient Lancashire borough, its history, industries, and amenities are here described by a citizen. See also Liverpool, University of; Birkenhead; Mersey, etc.; and pictures facing p. 5205

Liverpool, Lancashire, is a sea-port city on the right bank of the Mersey, 3 m. from the Irish Sea. It extends about 8½ m. along the E. side of the river and has an area of about 43 sq. m. The rateable value of the city is over £6½ million, and a penny rate produces about £26,000. The estimated pop. in 1949 was 802,000. The city returns nine M.P.s (1950) and is divided into 40 wards, returning 120 councillors and 40 aldermen to the city council. It is the seat of an Anglican bishop and of a Roman Catholic archbishop.

First Charter Granted 1207

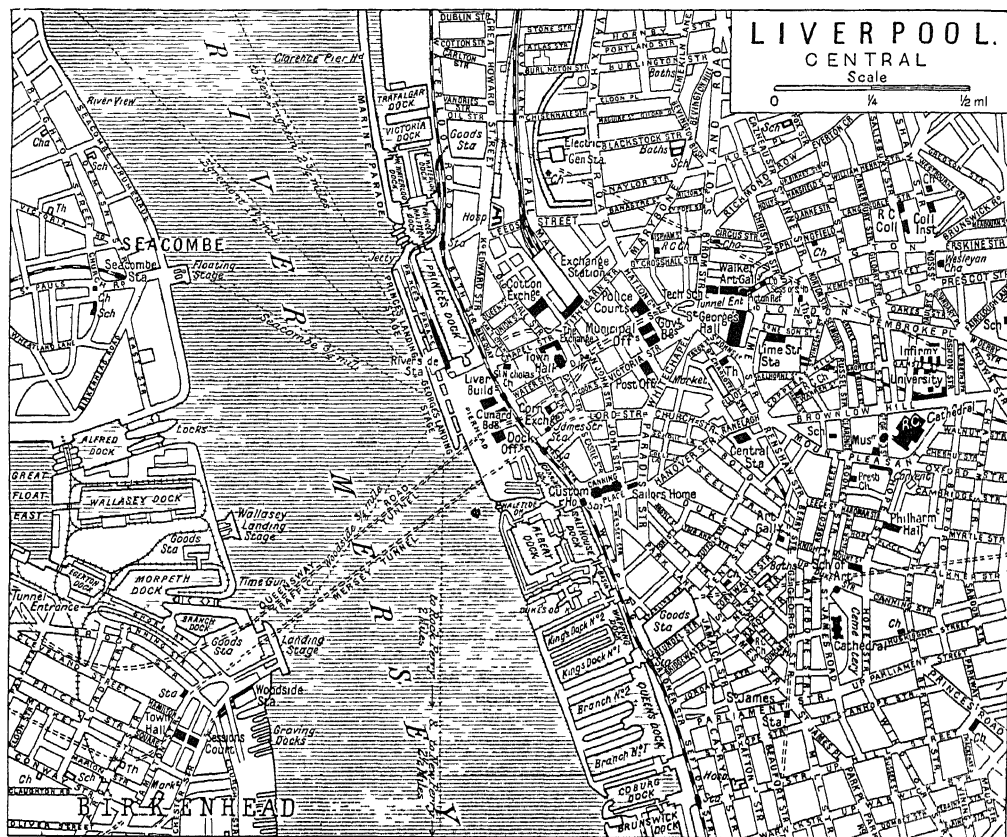
Although Liverpool has had a continuous record as a borough since 1207, when the first charter was granted by King John, few visible evidences of its early history remain. Until the completion of the first dock in 1715 the port was not particularly distinguished; but improved harbour facilities and an expanding trade with the newly developing colonies resulted in amazingly swift growth during the 18th and 19th cents. In this period most of the central area was rebuilt and from it date

the principal public buildings which escaped destruction in the bombing raids of 1940 and 1941.

The town hall, rebuilt 1795, is notable for its gracious interior and period furnishings. St. George's hall, completed 1854, and probably the finest example of Corinthian architecture in Great Britain, houses the law courts and two concert halls. The Anglican cathedral, begun in 1904, is in a local red sandstone and is an outstanding example of modern Gothic architecture. The architect, Sir Giles Gilbert Scott, achieved an impression of light and simplicity through his use of great spaces unimpeded by pillars or aisles. The cathedral with its great tower is admirably sited on St. James's Mount, high above the surrounding neighbourhood. The R.C. cathedral, architects Sir Edwin Lutyens (*q.v.*) and Adrian Gilbert Scott, is designed to be one of the largest Christian churches in the world. The new Philharmonic hall,



Liverpool arms



Liverpool. Plan of the central districts of the city, showing the docks on the Mersey and part of Birkenhead

centre in Europe), tobacco and rubber processing, sugar refining, and seed oil extraction. As a result of heavy unemployment in the early 1930s, caused by the world-wide slump, the corporation set up industrial estates at Speke, Fazakerley, and Kirkby, where financial and other facilities were made available to industrialists, and many thousands of her citizens found employment in the lighter industries developed on the outskirts of the city.

As the chief port for the manufacturing areas of Lancs, Yorks, and the Midlands, Liverpool is well served by rly., road, and canal. The city has three main-line rly. termini and there are over a hundred other stations in the area. There is a heavy passenger traffic on the three electrified rlys., one of which, the Overhead, offering a fine view of the 7 m. of docks, was the first electric overhead line in the world and served as a prototype for the New York elevated rly. The other lines run one to Formby and Southport to the N., and the other to Hoylake and West Kirby in the Wirral peninsula,

passing under the Mersey by the Mersey rly. tunnel, opened 1886. The Leeds and Liverpool canal connects with many inland industrial towns, and is much used for heavy freight. The good road system was greatly improved by the opening in 1934 of the Mersey traffic tunnel which connects Liverpool and S.W. Lancs with the Cheshire plain (see Mersey Tunnel).

At Speke, on the S. boundary of the city, is the airport, established as a municipal enterprise in 1933, and equipped with administrative buildings, hangars, and a control tower; it is operated by the ministry of Civil Aviation and is used by air lines with connexions to all parts of the world.

During 1921-39 Liverpool corporation built over 43,000 houses and flats, accommodating about 16 p.c. of the pop. In 1944 approval was given by the city council to a 22-year programme for the building of 91,000 permanent dwellings, a project entailing the complete redevelopment of the inner residential area of the city.

The Liverpool corporation supplies water and operates an ex-

tensive passenger transport system. The water supply is mainly derived from Rivington in Lancs, and Vyrnwy, an artificial lake in Wales. Construction of a fourth pipe-line from Lake Vyrnwy was started in 1947 at an estimated cost of £2½ million. Electricity is supplied by the Merseyside and North Wales electricity board; over one-third of the local output is supplied to the British electricity authority for use elsewhere. Gas is supplied by the North-Western gas board.

The city has many fine parks and recreation grounds with a total area of 2,100 acres. The parks dept. administers five golf courses, five boating lakes, 70 bowling greens, and many other recreational facilities, including an open-air theatre. There are six cemeteries and a crematorium.

During the Second Great War Allied strategy made Merseyside the war's greatest port. The enemy made repeated and sustained attacks from the air, but, despite heavy damage, the port of Liverpool was never closed. During 68 months of war 75 million tons of

cargo were handled and over 4,700,000 troops passed through. No fewer than 73,000 aeroplanes and gliders were landed at the port. Liverpool was also the strategic h.q. of the Western Approaches, and the battle of the Atlantic was directed from a control-room deep below an office block adjoining the town hall.

Liverpool had over 120,000 houses destroyed or damaged by aerial bombardment, and in one week in May, 1941, 1,453 people were killed and 1,065 seriously injured. The damage done to the city centre presented an opportunity to effect a complete redevelopment, and a 180-ft. inner ring road was planned to connect the three rail termini and the pier head, and so divert all through traffic from the central area.

Although by no means a holiday resort, Liverpool is much frequented by visitors who find a great deal to interest them in the port and the surrounding districts. The city is excellently placed for access to the holiday areas of N. Wales, the Lanes coast, and the Lake district. At the end of March each year the Grand National steeplechase, run at Aintree, a northern suburb, attracts racegoers from all parts of the world. The city has two prominent association football clubs, Liverpool and Everton; Liverpool Stanley is a rugby team; and the cricket ground at Aigburth is used for county matches.

Bibliography. History of the Commerce and Town of Liverpool, T. Baines, 1852; The Geology of the Country Round L., G. Morton, 1897; History of the L. Privateers and Loters of Marque, with an Account of the L. Slave Trade, G. Williams, 1897; Memorials of L., J. A. Picton, 1903; A History of L., R. Muir, 1907; The Rise and Progress of L. from 1551 to 1835, J. Touzeau, 1910; Social Survey of Merseyside, Vol. I, D. Caradog Jones, 1934; Merseyside Plan, F. L. Thompson, 1944.

Liverpool. Town of New South Wales, Australia, lying 20 m. by rly. west of Sydney. It is an expanding manufacturing centre, also one of the oldest agricultural, dairying, fruit-growing, and poultry producing centres in the state. Pop. 7,120.

Liverpool. Name of a pottery and chinaware. About 1730 some handsome blue and white earthenware was produced at Liverpool. Then Richard Chaffers (1731-62), having become interested in the matter, set out to Cornwall to find soapstone, with the aid of which he manufactured fine china, hard and

transparent. His output was marked by excellence of form, decoration, and colour. The factory was closed down on Chaffers' death. Philip Christian followed in his steps, but his products are less valued. John Saddler, a maker of excellent glazed earthenware, was the inventor of printing from copper-plates on china, and did much work of this kind for Wedgwood. Pennington's glazed blue punch bowls (1750-60), with seafaring pictures, were celebrated. *Consult* Liverpool and her Potters, H. B. Lancaster, 1937.

Liverpool, UNIVERSITY OF. English university. Founded in 1903, its nucleus was University College, Liverpool, which dated from 1881. In 1884 this became part of the Victoria university of Manchester, with which it remained until a charter was obtained in 1903. Liverpool has faculties of arts, medicine, law, science, and engineering, a department for the training of teachers, and a department of commerce, while its special schools include architecture, with a department of civic design, social science, tropical medicine, hygiene, local history and records, and Russian studies. It has an institute of archaeology, a large library, museums, laboratories, and a tidal institute. Women equally with men are admitted to degrees, and for both there are residential facilities. S. Aidan's College, Birkenhead, is affiliated to the university, as is the Harris Institute, Preston. University extension work is carried on. *See* Gown, colour plate.

Liverpool, CHARLES JENKINSON, 1ST EARL OF (1727-1808). British statesman. Eldest son of



1st Earl of Liverpool,
British statesman

Charles Jenkinson, who commanded the Royal Horse Guards at Dettingen, he was born at Winchester, April 26, 1727, and educated at Charterhouse and University College, Oxford. After acting as private secretary to Lord Bute in 1760, he became leader of the king's friends in the commons. He was appointed to several high offices, including those of under-secretary of state, joint secretary to the treasury, and president of the board of trade. In 1786 he was made Lord Hawkesbury, and in 1796 earl of Liverpool. He died Dec. 17, 1808. He wrote in 1758 a Discourse on the Conduct of the

respecting Neutral Nations, and in 1785 a Collection of Treaties between Great Britain and other Powers, 1648-1783.

Liverpool, ROBERT BANKS JENKINSON, 2ND EARL OF (1770-1828). British statesman. Son of the 1st



2nd Earl of Liverpool,
British statesman
After Lawrence

earl, he was born June 7, 1770, and educated at Charterhouse and Christ Church, Oxford. In Paris he witnessed the fall of the Bastille. Entering parliament in 1790 he worked his way to cabinet rank, and took part in framing the peace of Amiens in 1802; also later in causing its rupture, by insisting strongly on the retention of Malta by the British. Known since 1796 by the courtesy title of Lord Hawkesbury, he was made a peer in 1803, and became leader of the opposition to the Whig ministry. He succeeded to his father's earldom in 1808, and took office under Perceval in 1809, first as foreign secretary, and then as secretary for war.

On the assassination of Perceval in 1812, Liverpool became premier, and entered on a fierce struggle against the popular disturbances provoked by distress and harsh laws. His foreign policy was marked by steady opposition to the Liberal and Nationalist movement on the Continent. On Feb. 17, 1827, he was stricken with apoplexy and retired from office, dying Dec. 4, 1828. Liverpool Street in London was named after him. *Consult* Memoirs of the Public Life and Administration of the Earl of Liverpool, 1827; Life and Administration, C. D. Yonge, 1868.

Liverpool Daily Post. English provincial morning newspaper, circulating throughout N.W. England and Wales. Formerly it was called the Liverpool Daily Post and Mercury. The Mercury was founded by Egerton Smith in 1811, price sevenpence; the Daily Post (a survival of the twopenny Liverpool Journal) by Robert Rockcliff in 1855, at one penny. Egerton Smith was his own chief editor for thirty years. The Post's first editor was M. J. Whitty, also chief constable of Liverpool, who became proprietor. Edward Russell (*q.v.*), afterwards Lord Russell of Liverpool, became editor in 1869. The Weekly Mercury ran from 1811 to 1916; the Weekly Post from 1878 to 1940. In 1904 these

papers and the Liverpool Echo became the property of one company, and the two daily papers were amalgamated, as also were the weeklies in 1916.

Liverpool Echo. English provincial evening newspaper, circulating throughout Lancashire, Cheshire, Shropshire, and N. Wales. It was founded in 1879 by (Sir) Alexander Jeans, managing director of the Liverpool Daily Post. The first large evening paper in Lancashire, it is noteworthy for the many classified advertisements that it carries.

Liverpool Range. Mountain range of Australia. The central section of the main dividing range of New South Wales, with the Northern Blue Mts. it forms a horseshoe, 200 m. N.W. of Newcastle. It forms the S. section of the Great Dividing Range, and is crossed at the Murrurundi Gap by the N. rly. from Newcastle to Gunnedah. The Cassilis Gap, used by the Goulburn river, separates it from the Blue Mts.

Liverpool Regiment. Unit of the British army, whose official title is The King's Regiment (Liverpool).



Liverpool Regiment badge

Raised in Derbyshire in 1685 by Lord Robert Ferrers for service against Monmouth's rebellion, it was placed on the establishment as the 8th Foot and called the Princess Anne of Denmark's Regiment of Foot. It served under William III in Ireland and Flanders; upon the accession of Anne its title was altered to the Queen's Regiment of Foot, and it fought with Marlborough at Blenheim, Ramillies, Oudenarde, and Malplaquet. In 1715 as the King's Regiment of Foot it was engaged against the Old Pretender and granted its badge of the white horse of Hanover. The regiment was with George II at Dettingen in 1743 and with Abercromby in Egypt in 1801. In the Indian mutiny it saw the capture of Delhi and the relief of Lucknow. Further battle honours were gained in Afghanistan, 1878-80, and Burma, 1885-87. When the line regiments were given territorial designations in 1881, this one adopted the title of Liverpool. In S. Africa it helped to defend Ladysmith.

Forty-five battalions were raised by the Liverpool Regiment for service in the First Great War and

earned the battle honours: Retreat from Mons; Marne, 1914; Aisne, 1914; Ypres, 1914, '15, '17; Festubert, 1917; Loos, Somme, 1916, '18; Arras, 1917, '18; Scarpe, 1917, '18; Cambrai, 1917, '18. Battalions served in Macedonia, on the N.W. frontier of India, and at Archangel, 1918-19. During the Second Great War, units took part in the campaigns in Italy, Europe, and Burma. The Liverpool Irish form the 5th and 8th battalions, and the regimental depot is at Seaforth.

Liverpool Repertory Theatre. Opened in 1911, this playhouse, evolving from the Playgoers Club, gained for itself a prominent position in the history of the British theatre. Under the direction of Basil Dean, plays by Wilde, Ibsen, Shaw, Granville-Barker, Galsworthy, Synge, and Hauptmann were given each season. Productions were often on experimental lines. In 1917 the name of the theatre was changed to the Playhouse, and Dean was succeeded by W. Bridges Adams. From 1921, Nigel Playfair, as director, reorganized the system of the resident company putting on each play. Main parts were taken by "star" performers, Mrs. Patrick Campbell being one of the visitors. William Armstrong began his directorship in 1923, and part of his policy was to introduce new one-act plays. Robert Donat, Diana Wynyard, Catherine Lacey, Marjorie Fielding, Nova Pilbeam, and Herbert Lomas were among players who appeared with the Liverpool Repertory. Consult The Liverpool Repertory Theatre, G. Wyndham Goldie, 1935.

Liverpool Street. A London thoroughfare. It runs west from Bishopsgate Street to Blomfield Street, E.C., and is named after Lord Liverpool, prime minister 1812-27. Here is a rly. terminus for the E. region opened in 1875, by the then Great Eastern rly. and connected by subway with a station of the Metropolitan rly. Adjoining Liverpool St. are Broad Street station and a station of the Central Line. Before 1829 the thoroughfare was known as Old Bethlehem. The site was once occupied by a priory of canons of the Or-

der of the Star of Bethlehem, founded 1246 by Simon FitzMary, a sheriff of London; and at the dissolution the priory was given to the city for conversion into a hospital for the insane, an institution, familiar as Bethlehem, Bethlem, or Bedlam Hospital, which was removed to Moorfields in 1675, and again to Lambeth in 1815.

Numerous streets, courts, and alleys were swept away to make room for the rly. stations, which form a terminus for several bus services. Liverpool St. station was the scene of one of the worst air raid incidents of the First Great War, when German bombs fell during the rush hour, and there were many killed and wounded. It was badly damaged by blast as well as by direct hits in German air raids during the Second Great War. Liverpool Street figures in Gissing's *The Town Traveller*, and *The Nether World*.

Liversedge. Part of the Yorkshire (W. Riding) urban district of Spensborough (q.v.).

Liverwort (*Hepaticae*). Small class of flowerless plants allied to the mosses. Liverworts grow on damp ground, wet rocks, and the base of tree trunks. Some are scale-like (thallose forms), and others have a distinct stem and pellucid leaves (leafy liverworts). Sexual organs, as in mosses, are antheridia (male) and archegonia (female), which are variously situated in different orders and genera. The spores are produced in capsules which split open when mature; the spore on germinating gives rise to an intermediate plant known as a protonema, much as in the true mosses. From this arises the conspicuous stage of the liverwort, which in turn produces sexual organs, of which the archegonia develop into spore-capsules. The plants are found in all parts of the world. Larger thallose



Liverpool Street, London. Entrance to Liverpool Street station, a London railway terminus



Liverwort. Plant and fruit of *Marchantia polymorpha*

forms were anciently considered under the doctrine of signatures to be good remedies for liver troubles, but they have no economic value.

Livery (Fr. *livrée*, something delivered). Uniform worn by the menservants of a person of

position. From early times kings, nobles, and feudal lords gave a badge or cloth of uniform colour to their officers and retainers when in military employ, and the wearing of such livery was equivalent to a declaration of allegiance and to a claim to protection. Traces of this military connexion survived in the different coloured facings of the scarlet uniform of the British army, and perhaps in the distinctive patterns and colours of the tartans of Highland clans.

The obvious advantages of uniformity of dress in adding splendour to the retinue of a great personage, and in providing material for the clothing of a number of persons, led to its early adoption in indoor service, and in modern practice the servants of noblemen sometimes wear liveries of colours representing the heraldic tinctures of the armorial bearings of their employers, sometimes derived from ancient standards.

Corporations aggregate adopted the principle of a uniform dress for their members, and the word livery was gradually transferred to the association entitled to wear the distinctive garb. Hence the term livery of the city of London, meaning the freemen of the city entitled to wear the costume of the city or livery companies, and to vote at elections of the lord mayor, sheriffs, corporation officers, and members of parliament for the city.

Livery was also the term applied formerly to rations of food issued to a household and to the horses in the stables; hence the phrase livery stable, meaning properly one where horses are fed and attended to at a fixed charge, and only in a later, secondary sense one where horses are kept by their owner to be let out on hire.

In English law livery is the term used for giving possession of property, livery of seisin being the

pure feudal investiture, or delivery of corporeal possession of the land or tenement, which was held to be absolutely necessary to complete the donation. See City Companies; Freeman; London; Maintenance.

Livesey, SAM (1873-1936). A British actor. Born in Flintshire, Oct. 14, 1873, he made his reputation on the London stage in *Written in Red*, at the Court, 1912, and appeared in *Bulldog Drummond*, 1921; *Dracula*, 1927; *Richard of Bordeaux*, 1932; besides giving an outstanding performance as Bottom in *A Midsummer Night's Dream*, 1926.

Films in which he appeared included *Dreyfus*, *The Private Life of Henry VIII*, *Jew Suss*, and *Drake of England*. He died Nov. 7, 1936.

Of his three sons, Jack (b. June 11, 1901) earned esteem as the hero in *Lady Precious Stream*, 1936. Barrie (b. Oct. 16, 1904), after appearing in musical plays, gave a brilliant performance in *Love for Love*, 1934. Roger (b. June 25, 1906) joined the Old Vic-Sadler's Wells company in 1932, and later showed to great advantage in *Storm in a Teacup*, 1936; *Spring Meeting*, 1938; *Watch on the Rhine*, 1943; *The Banbury Nose*, 1944; *Ever Since Paradise*, 1947. On the screen he created memorable characters in *The Life and Death of Colonel Blimp*; *I Know Where I'm Going*; *A Matter of Life and Death*; and other films.

Live Wire. In electricity, name given to a conductor along which an electric current is flowing.

Livia. Name of one of the *gentes* or clans of ancient Rome. Of plebeian origin, the most important of its families were those of Drusus and Salinator. The historian Livy, Titus Livius, is the best known of the Livii.

Livia Drusilla. Wife of the Roman emperor Augustus. See Drusilla.

Livilla. Name of two Roman ladies in imperial times. One, also called Livia, was the sister of Germanicus. She married Drusus, the son of Tiberius, to whom she was unfaithful, and assisted Sejanus in putting him to death. Livilla (Julia), the youngest daughter of Germanicus, was banished to the island of Pontiae (Ponza) for taking part in a conspiracy against her brother Caligula. Allowed to return after the death of Caligula, she was again banished, and in 43 was put to death by Claudius.

Living. Term popularly used for an ecclesiastical benefice. A living is obtained by presentation, institution, and induction, and the incumbent must reside in his living for at least nine months of the year, unless he has leave of absence from the bishop. He may resign, or exchange livings with another incumbent, subject to the sanction of the bishop and the patron; but he can be deprived of his living only on the grounds of grave moral or ecclesiastical delinquency. See Benefice.

Living Costs. This subject is treated under Cost of Living.

Livingstone. Town of Northern Rhodesia, the capital of the country until 1935 when Lusaka superseded it. Founded in 1905, it was named after the explorer (*v.i.*). It is on the main rly. to Southern Rhodesia and the Belgian Congo and 4 m. from the left bank of the Zambezi. The Victoria Falls lying 7 miles S., Livingstone attracts tourists. Pop. est. 10,350.

The gorge on the Zambezi, between N. and S. Rhodesia, about 200 m. E. of this town, was formerly Kariba and is now Livingstone Gorge. Livingstone is also the name of a mt. range N. and N.E. of Lake Nyasa in Tanganyika. This range is a crescent 100 m. long with peaks rising to c. 10,000 ft.

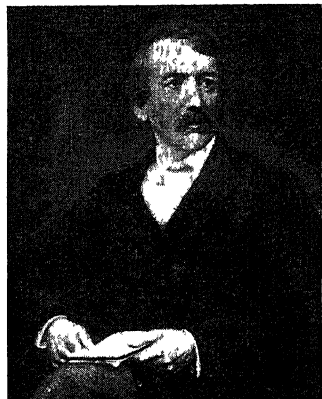
Livingstone, DAVID (1813-73). Scottish missionary and explorer. Born at Low Blantyre, Lanarkshire, March 19, 1813, he was the son of Neil Livingstone, a tea agent and deacon in the Independent church at Hamilton. His mother Agnes, was a daughter of David Hunter, a Blantyre tailor. His great-grandfather fell at Culloden fighting for Prince Charles.

David's early years, after the age of 10, were divided between a cotton mill and an evening school. By dint of saving he then managed to study medicine, theology, and Greek at Glasgow university. In 1838, influenced by the teaching of Dr. Thomas Dick, he offered his services to the London Missionary Society; and after attending the medical school at Charing Cross Hospital and gaining his diploma at Glasgow, he sailed, on Dec. 8, 1840, for South Africa to join Dr. Moffat (*q.v.*), whose daughter Mary he married in 1844. She died at Shupanga in 1862.

Eight years he laboured in Bechuanaland, teaching and ministering to the natives. In 1849, with his friend and benefactor, William Cotton Oswell, he crossed the Kalahari desert, discovered lake Ngami, and partly explored the

Zambezi. Inspired with a desire to link up the interior with the sea, he next conducted an expedition down the Zambezi to the Indian Ocean (1852-56), a marvellous contribution to geography and the natural sciences. In the course of it he discovered the Victoria Falls. After publishing his account in 1857, and severing his connexion with the L.M.S., he was appointed British consul at Quilimane. In 1858-64, with Dr. (later Sir) John Kirk (*q.v.*) he explored the Shiré and Rovuma and discovered Lake Nyasa. Then he again visited England to advocate further expeditions in the interests of commerce and for the suppression of the slave trade.

In 1865 he started on an expedition to solve the problem of the Nile basin, marched from Mikin-



David Livingstone

dani to the S. of Lake Tanganyika, 1868, and discovered Lakes Moero and Bangweulu. Late in 1871, H. M. Stanley (*q.v.*), sent out by The New York Herald to discover where Livingstone was, found him in sore need at Ujiji. Though wasted in health, Livingstone refused to return, and made further efforts to reach the sources of the Nile. At Ilala, on May 1, 1873, he was found by his native servants, kneeling by his bedside, dead.

It is estimated that, attended for the greater part of the time by only a few native servants, in 33 years he travelled over 30,000 m. of country hitherto unknown to the white man. He was the first European to traverse the length of Lake Tanganyika. His influence is exemplified by the fact that the notorious slave dealer Tippoo Tib suspended operations whenever Livingstone was in his neighbourhood. Having been embalmed and carried to the coast

by his followers, the explorer's body was conveyed to Westminster Abbey. A monument was erected on the spot where he died; a statue overlooks Victoria Falls since 1934.

Bibliography. L.'s *Missionary Travels in S. Africa*, 1857; *How I Found L.*, H. M. Stanley, 1872; *Last Journals*, ed. H. Waller, 1874; *L. and the Exploration of Central Africa*, H. H. Johnston, 1891; *L. the Pathfinder*, B. J. Mathews, 1913; *L.'s Last Journey*, R. Coupland, 1945; *Lives*, W. G. Blaikie, 1880; T. Hughes, 1889; R. J. Campbell, 1929.

Livingstone, Sir Richard. WYNN (b. 1880). British scholar. Educated at Winchester and New College, Oxford, he was vice-chancellor of Queen's university, Belfast, from 1924 to 1933, when he went to Oxford as president of Corpus. He was vice-chancellor of the university from 1944 to 1947. A brilliant classical scholar, he edited *The Classical Review*, 1920-22, and was in charge of the Clarendon series of Greek and Latin authors. He sat on the appellate tribunal for conscientious objectors in the Second Great War. His books include *A Defence of Classical Education*, 1917; *The Mission of Greece*, 1928; *Portrait of Socrates*, 1938; *Education for a World Adrift*, 1943. His translation of Thucydides' *History of the Peloponnesian War* appeared 1943. In 1931 he was knighted.

Livius Andronicus, Lucius (c. 284-204 B.C.). The first Roman dramatist. A Greek of Tarentum, he was taken at an early age as a prisoner of war to Rome. He was afterwards manumitted by his master, Livius, whose name he assumed. He became a teacher of Greek and Latin, and his Latin translation of the *Odyssey* in the rude Saturnian metre, made for his pupils, was long a favourite school text-book. In 240 he produced the first Roman drama, modelled on a Greek original, in iambic metre. This was followed by numerous similar adaptations, the subjects being taken chiefly from Greek legend and mythology (Achilles, Aegisthus, Danae).

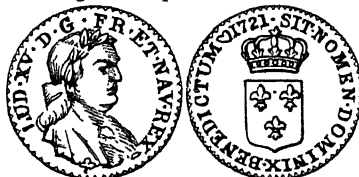
Livny. Town of the R.S.F.S.R. in the region of Kursk. It stands on the Sosna, a tributary of the Don, 90 m. S.E. of Orel, and is a rly. junction. Its chief industries are the manufacture of soap and candles, and considerable trade is done in grain, flour, hemp, cattle, and leather. Livny was founded in 1586, and was long a bulwark against Tartar invaders.

Livonia. Former Baltic prov. of the Russian empire, now divided between Latvia S.S.R. and Estonia S.S.R. It was bounded N. by Estonia, E. by Lake Peipus and a line nearly following the river Peddetz, S. by the river Dvina, and W. by the Gulf of Riga, the islands of Oesel and Mohn being included. The area was about 18,000 sq. m. The land is sandy and flat, except in the N.; forests, lakes, and marshes are plentiful. The pop., mostly Lutheran, was at the outbreak of the First Great War mainly Lettish and Estonian in nearly equal numbers. Riga and Yuriev (Dorpat, Tartu) were the only important towns. The Livs, who formerly occupied the country, have been almost entirely absorbed, and their language, of the Finnish stock, is nearly extinct.

German merchants having settled on the Dvina, Meinhard was sent from Bremen in 1186 as the first bishop to the Pagan Livs. Bishop Albert founded the Order of the Sword, 1202, giving a third of his diocese to the Brethren, who gradually imposed Christianity on the natives by force. Defeated at Saule, in 1236 by Lithuania, they became a province of the Teutonic Order, and waged long wars with Lithuania, Poland, Russia, and the archbishops of Riga, who were lords of the rest of Livonia. Russia seized the diocese of Dorpat in 1560, and Poland annexed nearly all the rest of Livonia in 1562. Sweden conquered it in 1621, and Russia, after many struggles, in 1721, losing it again from 1918 to 1939. *See* Estonia; Latvia.

Livorno. Italian name for the province and city of Italy known in English as Leghorn (*q.v.*).

Livre. Name of an old French coin. The livre varied in value according to its place of issue, but



Livre. Inscriptions on obverse and reverse of the old French coin. Actual size

the *livre Tournois* was usually taken as the standard, and was worth a little less than a franc, 81 *livres Tournois* equalling 80 francs. The coin was abolished in 1795. The livre was also a unit of weight weighing about 489 grammes. It was superseded in 1795 by the kilogram. *See* Metric System.

Livy (59 B.C.-A.D. 17). Roman historian. Titus Livius was born and died at Padua, but little is



Livy,
Roman historian
From a bust

known of the details of his life except that he was favoured by Augustus. Forty years were spent on his great work, a History of Rome in 142 books, from the founding of the

city to the death of Drusus in 9 B.C. Only about a quarter of the work has been preserved; our knowledge of the remainder depends upon tables of contents drawn up by scholars. Among scientific historians Livy has no place. He was quite uncritical, content to accept his facts from previous writers, without any attempt at independent verification. He did not even make any effort to use valuable material which lay to his hand, such as the scholarly antiquarian researches of Varro. Finally he was inclined to idealise earlier ages to the detriment of his own times.

Yet for all his faults Livy remains among the immortals. The wonder and romance of the growth of Rome from a tiny city state into a world empire are conveyed in a manner which reveals the workings of a truly great mind. As a stylist Livy is in the first rank. His writing has the primary virtues of simplicity and clarity, enhanced by a certain poetical colouring which accords well with the splendour of the subject. Livy is at his best in such passages as his sketch of the character of Hannibal, and in his descriptions of battles and sieges. His Works were ed. G. Weissenborn, rev. M. Müller, 1875-94.

Liwa. The unit of regional administration in Iraq. It replaced the Turkish vilayet.

Lixiviation (Lat. *lix*, ashes). Alternative term for leaching (*q.v.*), a metallurgical process.

Lixuri, LIXOURI, OR LEXEURION. Seaport of Cephalonia, Ionian Islands. It is on the W. of Argostoli Bay. Near it are the ruins of ancient Palé.

Li Yuan-Hung (1864-1928). Chinese statesman, a native of Hupeh. He saw service in the navy and army, but early became involved in politics. On the outbreak of the revolution of 1911 he commanded the troops at Wuchang, and was later elected vice-president in turn to Sun Yat-sen

and Yuan Shih-kai. On the latter declaring his aspirations to imperial power, Li Yuan-Hung resigned, but on the death of Yuan in 1916 he became president. In 1917 he was deposed by a royal faction, but resumed the presidency in 1922. In 1923 he was forced to retire. He died June 3, 1928.

Lizard (Lat. *lacerta*). Name applied commonly to any small four-limbed and tailed reptile or batrachian. Thus Pennant included the native newts as lizards in his British zoology. Later biologists restricted its use to the scale-clad sub-order Sauria of the reptilian order Squamata, of which the snakes form another sub-order, Ophidia. The Squamata include chameleons and geckos, which are placed in separate families. Lizards have movable eyelids, geckos have none, and chameleons have eyelids united into a cup-shaped covering to the eyeballs which bulge from the head, with a central aperture for admission of light.

So restricted, the lizards comprise about 2,500 known species, divided into 24 families. They are distinguished from the snakes by having the two halves of the lower jaw firmly united in front, by the possession of eyelids, and external openings to the ears. In addition they have collar-bones and flattened tongues. Among the many types of lizards we have the family Agamidae, including the flying dragon, the frilled lizard, the spiny-tailed lizards, of which *Uromastyx* in Africa eats dates, berries, and flowers, and *Moloch horridus* of Australia, whose rough, spiny skin absorbs water like blotting-paper. The Iguanidae, of which there are 300 species, are chiefly American, and include, beside the large iguanas, *Anolis*, which climbs trees after insects, and leaps from leaf to leaf like a tree-frog. The so-called horned toad is also of this family. The Anguidae (slow-worms) are usually legless, but the shoulder girdle and pelvic girdle, or vestiges of them, remain.

The Helodermatidae consist only of the gila monster, the only poisonous lizard known. The Varanidae include large monitors, of which some specimens of semi-aquatic habit have flattened tails. The 60 species of Amphisbaenidae are mostly legless, worm-like creatures of subterranean habit, frequenting ants' nests and manure heaps, occurring in tropical S. America and Trinidad. Most Scincidae also are legless and snake-like, but a few have two or four

limbs. The N. African *Mabuya vittata* has the singular habit of sitting on the floating leaves of water-lilies, and diving into the water when alarmed. It returns to shore for sleep, which it takes under the cover of stones.

The family Lacertidae, with about 100 species, includes all the true lizards in the narrower sense. These are represented in Great Britain by two species only, the common lizard (*Lacerta vivipara*) and the sand lizard (*L. agilis*). Only the former occurs in Ireland, where it is the sole representative of the Reptilia.

With the exception of the Polar regions, the distribution of the lizards is world-wide. As indicated in the brief notice of the principal families, they affect different habitats, some being arboreal, others frequenting heaths and sandy places, some burrowing underground, and some passing a good deal of time in or about the water; but none is truly aquatic. A few take vegetable food, but lizards are almost exclusively carnivorous, their food being insects, spiders, and slugs, though some of the larger forms consume birds and their eggs, mice, etc.

Viviparous Reproduction

The lizards are all produced from eggs, but in certain species—e.g. the British slow-worm and common lizard—the eggs are retained until the embryos are ripe for hatching, and they hatch in the process of oviposition or immediately after. Such species are regarded as viviparous. The eggs of some species have hard, chalky shells, like those of birds; in others they are more of the character of parchment. The embryo has an "egg-tooth"—a spine on the snout for the purpose of breaking the egg-shell. Lizards either aestivate or hibernate; in the tropics they retire into the earth, or under rocks during periods of drought, and in temperate regions become torpid in similar retirement before the winter, with its scarcity of insect-food, arrives.

The common lizard (*L. vivipara*), frequent on heaths and dry pastures throughout Great Britain, is about 6 ins. in length, the females slightly longer. The tail equals head and body in length. The colour of the upper side is variable, but is always some tint of brown more or less obscurely spotted with darker brown, the spots forming broken lines. The males are orange or red beneath, spotted with black, and the same parts in the female are yellow, orange, or pale green

with or without spots. They consume insects and spiders, leaping lightly over the grass or heather in pursuit of flying prey. In this manner they catch quite large-bodied moths, which can be swallowed only after a considerable amount of chewing. The young (from 6 to 12) are produced anywhere, without any pretence of a nest. They are black at first, and about an inch long. They remain without movement for several days, the parents taking no care of them. The earliest remains of lizards occur in Tertiary strata. See Chameleon; Frilled Lizard; Gecko; Gila Monster; Glass-snake; Heloderm; Horned Toad; Iguana; Slow-worm; also colour plate.

Bibliography. British Lizards, G. R. Leighton, 1903; Reptiles of the World, R. L. Ditmars, 1936; Handbook of Lizards, H. M. Smith, 1946.

Lizard, THE. Most southerly point of England. It is in Cornwall, 10 m. S. of Helston, its nearest rly. station. The name is also given to the peninsula which terminates in a bold promontory, surmounted by a lighthouse, the actual Lizard Point, 186 ft. high. In the district are the villages of Lizard Town, Mullion, Landewednack, Cadgwith, Ruan Major, Ruan Minor, and Gunwalloe, with a 15th century church. The coast is remarkable for the beauty of its cliff scenery, with characteristic green serpentine rock, and for its coves, Poldhu, Kynance, Polpeér, and Mullion. There is bathing at Housel Bay. From Poldhu Marconi established communication by wireless with Newfoundland. The Lizard is referred to by Ptolemy.

Ljubljana (Ger. Laibach). Tn. of Yugoslavia, capital of the region of Slovenia. Under the German name of Laibach it was the chief town of Carniola in the Austro-Hungarian empire. Situated on the river Laibach or Ljubljana, it is 44 m.



Llama. Small member of the camel family, an animal peculiar to South America

N.E. of Trieste, and linked by rly. with Fiume, Klagenfurt, and Zagreb. It was settled in Roman times under the name of Emona. The town passed to the Hapsburgs in the 13th century and, except during 1809-13, when it was in French occupation, continued as an Austrian fief until 1918. Principal buildings are the 18th century cathedral, the town hall, the university (founded 1919), and a museum with relics from lake-dwelling remains in the adjacent fens. Industries include cotton spinning and bell founding.

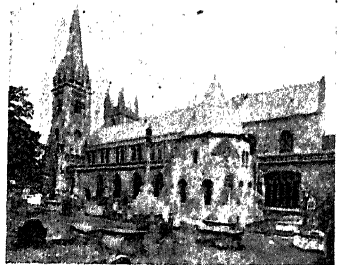
After the German invasion of Yugoslavia on April 6, 1941, the Italians captured Ljubljana on April 12, annexing Slovenia at the end of the month. Taken over by the Germans after Italy's surrender, 1943, it remained in their hands until May, 1945. Pop. 79,056. See also Laibach.

Ljusne. Seaport and river of Sweden, in the län or government of Gävleborg. The town stands at the mouth of the river on the Gulf of Bothnia, 38 m. by rly. N. of Gävle. There are large ironworks here. The river flows from a lake of the same name S.E. through Jämtland and Gävleborg, where it forms several lakes, and discharges into the Gulf of Bothnia after a course of about 218 m.

Llama. Group of mammals belonging to the camel family, and found only in S. America. They are smaller than the camel, are of lighter build, and have no hump. The tail is much shorter, and the woolly hair is usually longer, while the dentition is different. They occur only in the S. and W. of S. America, and chiefly among the mountains. The wild species are known as the guanaco and the vicuña, and it is a domesticated breed of the former which is usually known as the llama, another and smaller breed being called the alpaca. The llama is about the same size as the wild guanaco, and is usually white in colour. It has been used from early times as a beast of burden and for riding, the females being also valued as milch animals. See Guanaco.

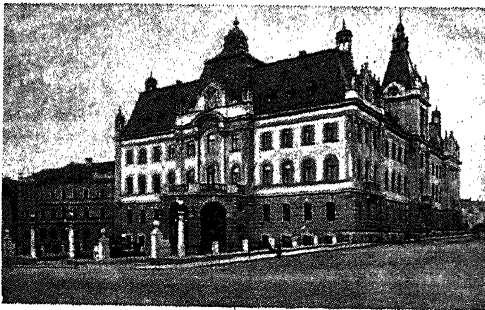
Llanberis. Village of Carnarvonshire, Wales. It is 9 m. E.S.E. of Carnarvon on the railway. Romantically situated between two small lakes, Llanberis is a centre for tourists making the ascent of Snowdon. Near by is the ruin of Dolbadarn Castle, a fortress of Edward I's time. Llanberis Pass to the S.E., between Snowdon and Glydyr Fawr, is a wild and beautiful defile rising to a height of 1,170 ft., over which there is a coach road. Slate is quarried here. Pop. 2,370. See Snowdon.

Llandaff. Part of the city of Cardiff, Wales. It stands on the Taff, 149 m. W. of London, and

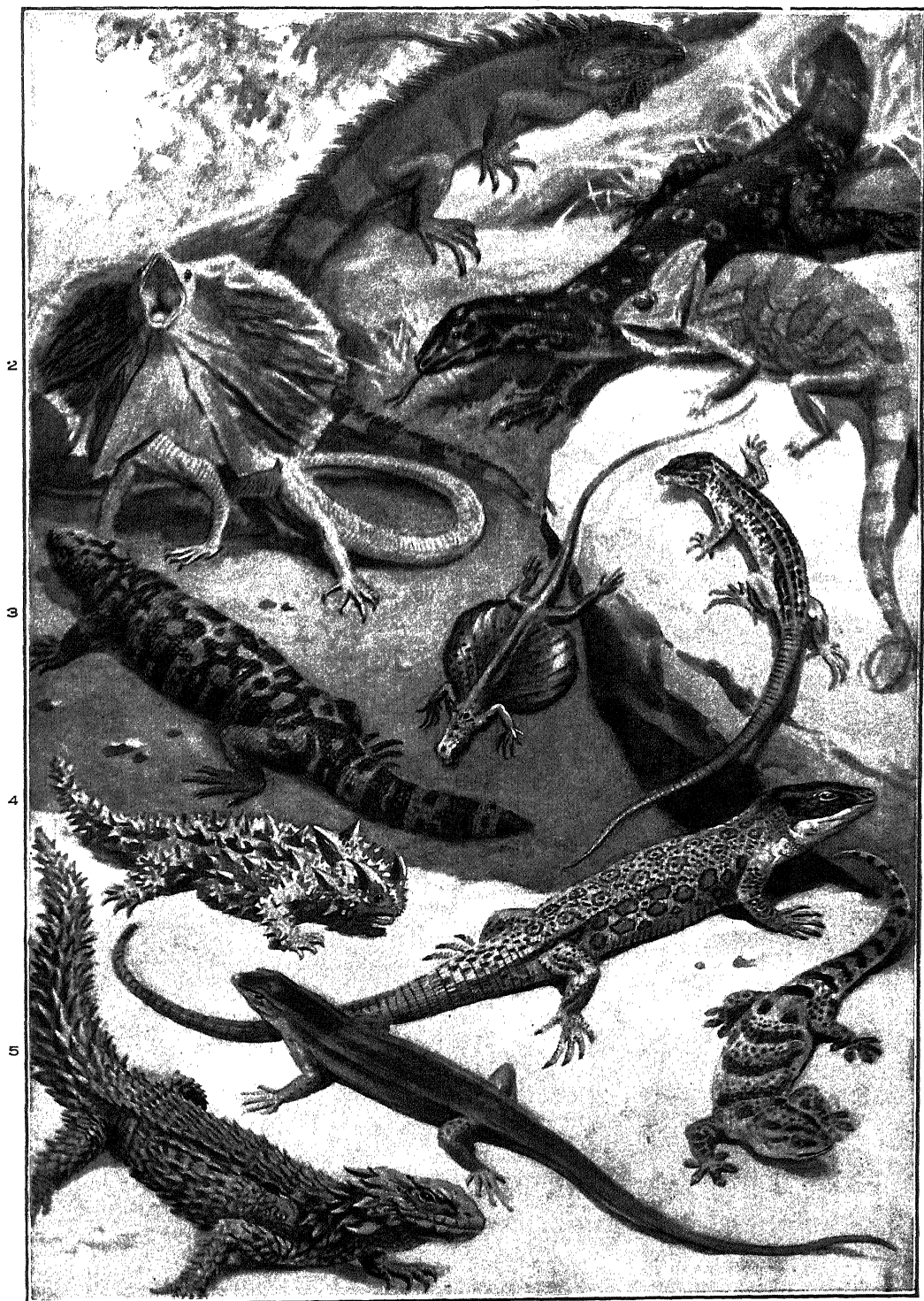


Llandaff. Cathedral church of SS. Dubricius and Telfo, restored 1843-69, destroyed by German bombs in 1941

is served by rly. It was included in the city boundaries in 1922. Llandaff was the seat of a bishop in the 6th century or earlier. The cathedral, its chief building, was virtually rebuilt in the 19th century and was destroyed in a German air raid Jan. 2, 1941. There are slight remains of the castle that once stood here, and the city has an old stone cross. A girls' school is maintained by the Howell Trust. Market day, Sat. Pop. 14,625.



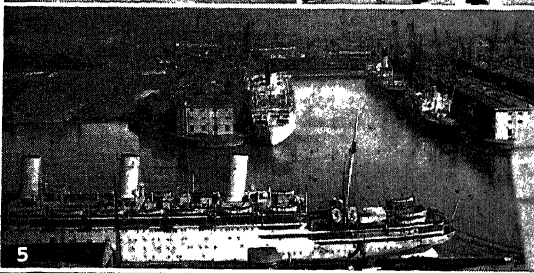
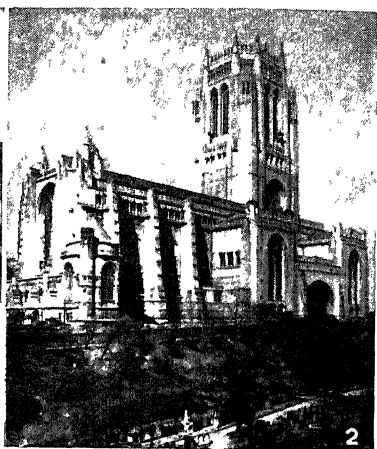
Ljubljana, Yugoslavia. The town hall and former palace of the governors



1. Common iguana, *Iguana tuberculata*, W. Indies, S. and Central America. 2. Australian frilled lizard, *Chlamydosaurus kingi*. 3. Gila Monster, *Heloderma suspectum*, Arizona - West Mexico, etc. 4. Moloch lizard, *Moloch horridus*, W. & S. Australia. 5. Great girdled lizard, *Zonurus giganteus*, S. & Tropical Africa, Madagascar. 6. Water monitor, *Varanus salvator*, Nepal,

S. China. 7. Arabian chameleon, *Chameleon calypratus*. 8. Wall lizard, *Lacerta muralis*, S.E. Europe, Asia Minor N. Africa. 9 (centre). Flying dragon, *Draco cornutus* Indo-Malaya. 10. Eyed lizard, *Lacerta lepida*, Europe. 11. Common gecko, *Tarentola mauritanica*, S. Europe. 12. Emerald skink, *Dasia smaragdina*, Tropics. The figures are not proportionate

LIZARD: VARIETIES OF THE FAMILY FROM ALL PARTS OF THE WORLD



1. St. George's Hall, built 1838-54 2. The Anglican Cathedral, begun in 1904, designed by Sir G. Gilbert Scott, an impressive example of modern Gothic. 3. University buildings, 1845-92 4. Town Hall, 1748-54 5. Shipping

in the docks 6. Kingsway entrance to the Mersey tunnel from St John's Gardens 7. Air view of St. George's pierhead showing, left to right, Royal Liver building; Cunard White Star building; Dock Board offices

LIVERPOOL: VIEWS OF THE SECOND SEAPORT OF GREAT BRITAIN. See pp. 5197-99.

Llandaff, HENRY MATTHEWS, VISCOUNT (1826-1913). British politician. Born Jan. 13, 1826, in Ceylon, where his father was a judge, he was educated there and studied law at the universities of Paris and London. Called to the bar in 1850, he became Q.C. in 1868, and that year he entered parliament as Conservative M.P. for Dungarvan. He lost his seat in 1874 but in 1885 was returned for E. Birmingham. In 1886 he was made home secretary, and remained in office until 1892. In 1895 he was made a viscount. As he died unmarried, April 3, 1913, the title became extinct.

Llandeilian Group. In geology, rocks of upper mid-Ordovician age. In Wales they are represented by mudstones, slates, and volcanic rocks of Cader Idris, Capel Curig, Conway, etc. The Borrowdale Volcanic series of the Lake District are of this age. In S. Ayrshire and Dumfriesshire, and in Shropshire, the rocks are dominantly sediments. *See* Ordovician.

Llandilo or **LLANDEILO**. Urban dist. and market town of Carmarthenshire, Wales. It stands on the Towy, 15 m. E. of Carmarthen, with rly. stations. The chief building is the church of S. Teilo, while near the town is Dynevor Castle, the seat of Lord Dynevor. This is a 17th century building, with the ruins of the original castle near it. The town, named after S. Teilo, owes its growth to the castle of Dinefawr built here in the 9th century. This was the residence of the princes of S. Wales, afterwards passing to the family of Rice. Water is supplied by the council, which owns provision and cattle markets. Market day, Sat. Pop. 2,000.

Llandovery. Mun. borough and market town of Carmarthenshire, Wales. It stands near the rivers Towy and Bran, 26 m. N.E. of Carmarthen, with a rly. station. It is in the parish of Llandinog, of which the church is S. Dmgal's. There are a market house, ranking as an ancient monument, and remains of a castle built in the 12th century. Llandovery became a borough in 1485. Around are lead mines, while the town has horse and cattle fairs. Market day, Fri. Pop. 2,000.

Llandovery College. British public school. It was founded and endowed by Thomas Phillips in 1848 as a school on Anglican lines. It is divided into upper, middle, and lower schools and has about 150 boys. There are entrance and leaving scholarships. Additions

to the original building include laboratories and a gymnasium.

Llandovery Group. In Geology, lowest division of the Silurian system in Great Britain. The strata were laid down in a broad N.E. to S.W. trough stretching across S. Scotland, N. England, and Wales. Beds near the trough margins are sandy and pebbly, such as the May Hill sandstone, Glos.; those in its centre were muddy deposits and are now largely slates. Upper Llandovery rocks found in a boring at Chilham, Kent, belong to a second trough of deposition which spread over S.E. England and N.W. Europe. The term Valentian is an alternative for Llandovery. *See* Silurian.

Llandrindod Wells. Urban district, spa, and inland holiday resort of Radnorshire, Wales. It stands on the Ithon, 6½ m. N. of Builth, and on the rly. from Shrewsbury to Swansea. There is bracing air at 800 ft. above sea level and splendid scenery. The mineral springs were known in the 18th century. In the new town are parks, golf courses, and facilities for angling. Pop. 2,925.

Llandudno. A watering-place and urban district of Carnarvonshire, Wales. It stands on the N. coast, just E. of Great Orme's Head and the mouth of the Conway, spreading across the neck of the Creud-dyn peninsula towards Conway Bay. Little Orme's Head is on its E. side. By rly. the town is 48 m. W.N.W. of Chester. It is connected with Colwyn Bay by electric tramway and trams connect E. and W. fronts. There are promen-



Llandudno arms

ades, a fine pier, golf links, and other attractions for visitors. The council supplies gas, water, and electricity. On Great Orme's Head, which is encircled by a marine drive, are various antiquarian remains, and the restored church of S. Tudno, said to date from the 7th century. The "happy valley" is a centre of recreation and amusement at the foot of Great Orme. On the W. promenade is a memorial to Lewis Carroll, a frequent visitor. Llandudno's position made it a popular watering-place as soon as rly. communication was established. During the Second Great War many buildings were occupied by the inland revenue department. Pop. 13,677.

Llandyssul. Market town and parish of Cardiganshire, Wales. It stands on the Teifi, 7 m. E. of Newcastle Emlyn, with which it has rly. connexion. Near are remains of two castles and some barrows. Market day, Tues. Pop. 2,590.

Llanelly. A seaport, mun. borough, and market town of Carmarthenshire, Wales. It stands



Llanelly arms

on Burry Inlet, an opening of Carmarthen Bay, 12 m. W.N.W. of Swansea, with a rly. station. The chief buildings are the church of S. Elli, rebuilt except for its tower (13th century), and two town halls. There are extensive markets and a free library. Parc Howard is the chief public pleasure ground; therein is a picture gallery and museum. Llanelly owes its prosperity to the growth in the industrial activity of S. Wales. It is the centre of the tinplate industry and has works for refining copper and making



Llandudno, N. Wales. The sea front from Great Orme's Head; the low hills in the background terminate (left) in Little Orme's Head

chemicals, etc. The extensive docks include a large floating dock, from which coal is exported. Llanelli gives its name to a co. constituency. Market days, Thurs. and Sat. Pop. 38,393.

Llanes. Harbour of Spain, in the prov. of Oviedo. It stands on the Bay of Biscay, 60 m. W. of Santander (45 m. direct) by coast rly. to Oviedo. It has remains of fortifications, a 15th century Gothic church, and an Augustinian monastery, now used as a school and meteorological station. A popular watering-place, it carries on a thriving trade in lumber, fish, and agricultural produce. Pop. 23,779.

Llanfairfechan. Urban district and seaside resort of Carnarvonshire, Wales. It stands at the foot



Llanfairfechan, N. Wales. Aber Falls, one of the most beautiful features of the district
Frith

of Penmaenmawr Mt., 8 m. S.W. of Conway by rly. There is a sandy beach where good bathing can be enjoyed. Pop. 3,162.

Llanfairpwllgwyngyll. Postal abbreviation of Llanfairpwllgwyngyllgogerychwyrndrobwllllantysilioogogoch, a small market town in Anglesey, Wales, 1 m. W. of the Britannia bridge, with a rly. station. The English translation of the name is: "The Church of S. Mary, in a hollow of white hazel, near the rapid whirlpool and S. Tysilio's church, near a red cave." The first women's institute in England and Wales was formed here in 1917. See-Place Names.

Llangammarch. Village and inland watering-place of Brecknockshire, Wales. It stands at the junction of the Irfon and Gammarch rivers, 15 m. N.E. of Llandovery on the rly. There is a spring

containing chloride of barium, efficacious in the treatment of strumous troubles.

Llangefni. Urban district and market town of Anglesey, Wales. It stands on the Cefni, 8 m. N.N.W. of Carnarvon, with a rly. station, and trades in agricultural produce. Market day, Thurs. Pop. 1,782.

Llangollen. Urban dist. and market town of Denbighshire, Wales. It stands on the Dee, 9 m. S.W. of Wrexham, and has a rly. station. A 14th century bridge, regarded as one of the three wonders of N. Wales, crosses the Dee here. The church of S. Collen is partly Norman. There are a town hall and a market. The vale of Llangollen is 8 m. in length. An object of interest is the house, Plas Newydd, in which lived the Ladies of Llangollen (*q.v.*), Lady Eleanor Butler

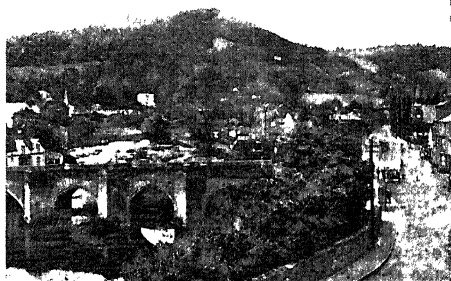
and the Hon. Sarah Ponsonby; these Irish recluses were visited by many celebrated early 19th-cent. personalities. Near Llangollen are the remains of an old castle and of a Cistercian abbey, Valle Crucis. Eliseg's pillar is another antiquity, while Pengwern, an old residence, dates from the 14th century. Near the town an aqueduct carries the Ellesmere Canal across the Dee. Pop. 2,366.

Llanidloes. Mun. borough and market town of Montgomeryshire, Wales. It stands on the Severn, 10 m. from its source and 19 m. S.W. of Montgomery, with a rly. station. The chief buildings are the old parish church of S. Idloes, restored in the 19th century and containing portions of the abbey of Cwm Hir; the old market hall, now a museum; and the town hall, with market hall and public library. There are engineering and fancy leather industries, while fishing is available. Llanidloes became a corporate town in the 13th century. Market day, Sat. Pop. 2,356.

Llano Estacado (Sp., staked or palisaded plain). Large arid plateau of the U.S.A., extending from the Pecos river, New Mexico, E. well into Texas. About 400 m. by 150 m., it slopes to the S.E. from 5,000 ft. to 2,000 ft. During the wet season rainwater percolates through the sandstone and sufficient grass grows on the surface to feed cattle. Unless the underground stores of water are tapped or the irrigation schemes of the Pecos river are extended, crops

cannot be grown. The Spanish name is explained in three ways. The plateau edges are steep scarps or "palisades"; the "stakes" are the stalks of the yucca plants which abound; or stakes were driven by the early pioneers as a guide across the "ocean of prairie desert."

Llanos (Sp. plains). Name given in S. America to treeless plains or prairies and particularly to the tropical grasslands or Savannas in



Llangollen, N. Wales. The Dee and 14th cent. bridge, counted as one of the three wonders of N. Wales
Frith

the basin of the Orinoco river. Large numbers of cattle are reared on the llanos, but this industry and the introduction of others are impeded by the summer floods and the prolonged drought of the dry winter season when great tracts are little better than deserts. *Pron.* Yah-nos.

Llanquihue. Prov. of S. Chile. It lies between the Andes and the Pacific, S. of Valdivia prov. An elevated tableland in the N., it is mountainous elsewhere, and its coast-line is considerably indented by fjords. The prov. is heavily forested and watered by several short rivers. It contains Llanquihue Lake, which has an area of 225 sq. m. and is the largest sheet of fresh water in Chile. To the E. of the lake rise the volcanoes Osorno and Calbuco, with an alt. of 8,700 ft. and 5,550 ft. respectively. There are several settlements on the lake. The prov. yields timber, livestock, and cereals, besides animal and agricultural products. Area, 7,005 sq. m. Pop. 117,225. The longitudinal valley of Chile stretches N. from the chief town, Puerto Montt (*q.v.*), which is the S. terminus of the rly. from Santiago. *Pron.* Yan-kee-weh.

Llanrwst. Market town and urban dist. of Denbighshire, Wales. It stands on the Conway, 11 m. S. of Conway, with a rly. station. The church of S. Grwst is modern. An adjacent chapel, built by Inigo Jones, contains some ancient work removed from an abbey, and other features of interest. Jones also

designed the bridge across the Conway. The chief industries are tanning and food production, while the town is a tourist centre. Market day, Tues. Pop. 2,800.

Llansamlet. Two parishes of Glamorganshire, Wales, known as Higher and Lower. They are part of the co. bor. of Swansea, and have a rly. station. The chief industries are smelting, steelworks, and tinplate works. Pop. 8,000.

Llantarnam. This place in Monmouthshire, England, is part of Cwmbran (*q.v.*).

Llanthony. Ruined abbey in Monmouthshire, England. It stands on the Honddu river, 9 m. N. of Abergavenny. Founded by the Austin Friars in 1107, it is described by Giraldus Cambrensis. The existing ruins, those of buildings of a somewhat later date, were at one time the property of Landor, who tried here the schemes that eventually ruined him. About 4 m. away is the modern abbey, founded in 1870 by Father Ignatius. Just outside Gloucester are the scanty ruins of another



Llanthony, Monmouthshire. Chancel of the ruined abbey of the Austin Friars
Frith

Llanthony Abbey, an offshoot of the one in Monmouthshire.

Llantwit Major. Market town of Glamorganshire, Wales. It is 5 m. by rly. S. of Cowbridge. In the 5th century a saint named Illtyd established a monastery here, which became famous as a missionary centre, and also for its school. The remarkable church, which dates from the 13th cent. and was rebuilt in the 14th consists of two parts, eastern and western. Much of it was restored c. 1900. There are other ecclesiastical remains of peculiar interest. Near the town are remains of a Roman villa which has been unearthed, and a mile away, on the Bristol Channel, is Collhugh, formerly the port of Llantwit. Pop. 3,500. *Consult* L. M., A Fifth Century University, A. C. Fryer, 1893.

Llantrisant (Church of the three saints). Town and parish of Glamorganshire, Wales, lying 10 m. N.W. of Cardiff and as far N.E. of Bridgend. The three saints to whom its rebuilt Norman church is dedicated are Illtyd, Gwynno, and Dyfodwg. The castle was reputedly one of the strongest in medieval Wales; it is now owned by the marquess of Bute. Llantrisant was a corporate town from the 14th century until 1883, and is now under a town trust. It has a rly. station and, though formerly a market town, has become the centre of a development area with new factories.

Llanvirnian Group. In geology, rocks of lower mid-Ordovician age. Lavas and ash beds mixed with slates bear evidence of local vulcanism at Cader Idris and Arenig in Wales. Elsewhere in Great Britain the group is mainly shales and slates, but some volcanic ashes occur. *See* Ordovician.

Llanwrtyd Wells. Urban dist. and inland watering-place of Brecknockshire, Wales. It stands on the Irfon, 13 m. by rly. W.S.W. of Builth Wells. It is noted for its springs of chalybeate and sulphur, widely known in the 19th century. The Dolecoed sulphur spring is said to be the best of its kind in the kingdom. There is a pump-room. The place is visited for trout-fishing, and attractions include the Abernant pleasure grounds. Pop. 750.

Llerena. Town of Spain, in the prov. of Badajoz. It stands in a fertile plain, 60 m. direct and 90 m. by rly. N. of Seville. It has a Renaissance church with a tower constructed after the style of the Giralda in Seville. In the neighbourhood are silver mines. Here on April 11, 1812, British cavalry defeated a French force. Pop. 7,352.

Llewellyn, JOHN JESTYN, 1st BARON (b. 1893). British politician. He was born at Chevening, Kent, Feb. 6, 1893, and educated at Eton and University College, Oxford. Called to the bar in 1921, he entered parliament in 1929 as Conservative member for Uxbridge, retaining this seat until 1945. From junior offices he rose to be civil lord of the Admiralty, 1937-39, and after holding various

parliamentary secretaryships was minister of Aircraft Production in 1942. He went to Washington in the new office of resident minister for Supply, and returning in 1943 was minister of Food until the end of the National government. Chairman of the European regional committee of U.N.R.R.A., he received a peerage in 1945.

Llewellyn, SIR WILLIAM (1863-1941). British painter. Born at Gloucester, he studied under



Sir W. Llewellyn.
British painter

Poynter at the R.C.A. and in Paris under Cormon. First exhibiting at the R.A. in 1885, he became well known as a *sauve* and accomplished portrait painter. Elected A.R.A., in 1912, and R.A., in 1920, he was president in succession to Dicksee, 1928-38. In 1935 he painted the portrait of Archbishop Lang for a series at Lambeth Palace. A celebrated work was the state portrait in 1910 of Queen Mary. He was a trustee of the National Gallery from 1933. Knighted in 1918, Llewellyn died Jan. 28, 1941.

Llewelyn (old Welsh, lion-like). Name of two princes of N. Wales. Llewelyn the Great, son of Iorwerth, reigned from 1194 to 1239, married King John's natural daughter Joan, 1206, conquered most of S. Wales, but was repeatedly attacked and defeated by John. For many years he fought with varying success against Henry III. He finally submitted in 1237, and retired in 1239 to a monastery at Aberconway, where he died April 11, 1240. He is reputed to have been the greatest of Welsh princes.

His grandson, Llewelyn ap Gruffydd, became prince of North Wales about 1246, in succession to his uncle David. His life was mainly passed in wars with England, which began in 1256. At first Llewelyn was successful, owing to the civil war in England, and in 1265 his independence was recognized. In 1276, however, the struggle was renewed by Edward I. Driven back to his mountain fastnesses, Llewelyn surrendered and was a prisoner for about five years. In 1282 he rebelled and was killed in a fight near Builth.

Llorente, JUAN ANTONIO (1756-1823). Spanish historian. Born in Aragon, March 30, 1756 he entered

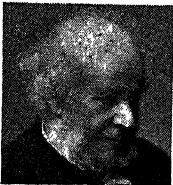


J. A. Llorente,
Spanish historian

the Church, becoming an official of the Inquisition. Suspected of having sceptical opinions, Llorente was dismissed from the Holy Office, but was soon reappointed. Under Joseph Bonaparte, he became keeper of the records of the Inquisition in Madrid. His critical History of the Spanish Inquisition was issued in four volumes, 1815-17. Llorente died Feb. 5, 1823. *Pron.* Lyoren-ty.

Lloyd, GEORGE AMBROSE LLOYD, 1ST BARON (1879-1941). British administrator, born Sept. 19, 1879. Educated at Eton and Trinity College, Cambridge, he studied Oriental politics, then travelled in Burma, India, Tibet, Egypt, and Asia Minor. In 1908 he was special commissioner to inquire into British trade with the Near East. Conservative M.P. for W. Staffs, 1910-18, he served in the East throughout the First Great War, and then governed Bombay for five years made difficult by the non-cooperation of Mahatma Gandhi. He represented Eastbourne in parliament, 1924-25. Raised to the peerage, he was then sent to Egypt as high commissioner. Here his firmness won the approval of many, but a rather high-handed attitude towards the Egyptian nationalists led to his recall by the Labour government in 1929. Lloyd became a stern critic of what he considered a weak foreign policy. He was colonial secretary from May, 1940, but died suddenly on Feb. 4, 1941. He wrote *Egypt since Cromer, 1933-34*. His son Alexander (b. 1912) succeeded. *Consult* Life, C. F. Adam, 1948.

Lloyd, EDWARD (1815-90). A British newspaper proprietor. Born at Thornton Heath, Surrey, Feb. 16, 1815. Lloyd started business as a news-agent and bookseller, and then became a publisher of miscellaneous literature. He founded on Nov. 27, 1842, Lloyd's Weekly London Newspaper, which became familiar as Lloyd's News until 1924, and in 1876 established The Clerkenwell News as The



Edward Lloyd,
British newspaper
proprietor

London Daily Chronicle. He also founded large paper mills at Sittingbourne, Kent. The first Hoe rotary press set up in England was to his order, and printed the issue of Lloyd's News for July 6, 1856. He died April 8, 1890, but until 1918 the great newspaper business he built up was conducted by members of his family.

Lloyd, EDWARD (1845-1927). British singer. Born in London, March 7, 1845, he became a chorister of Westminster Abbey, and in 1869 a gentleman of the Chapel Royal, where he was solo tenor. He relinquished that post to devote himself to concert singing, and from 1871 until his retirement in 1900 was regarded as the leading tenor in England. His greatest successes were perhaps in Handel, Wagner, and Elgar's *Dream of Gerontius*. He died March 31, 1927.

Lloyd, SIR FRANCIS (1853-1926). British soldier. Born Aug. 12, 1853, he was educated at Harrow, and was commissioned in the Grenadier Guards. He served in Egypt in 1885 and 1898, and in the South African War commanded a battalion. He was in charge of the Guards brigade at Aldershot, 1904-08, and at the head of the Welsh (territorial) division, 1909-13. Before and during the First Great War, Sir Francis (knighted 1911) was general officer commanding the London district. He was made lieutenant-general in 1917. Food commissioner for London and home counties, 1919-21, he retired from the army in 1920. He died Feb. 26, 1926.

Lloyd, GEOFFREY WILLIAM (b. 1902). British politician. He was born Jan. 17, 1902, and educated at Harrow and Trinity College, Cambridge. Lloyd was private secretary to Stanley Baldwin, 1929-31, then parliamentary private secretary after he had entered the house of commons as Cons. member for Ladywood. Parliamentary under-secretary at the home office, 1935-39, in 1940 he took charge of petroleum warfare with its dept. at the ministry of fuel and power. Minister of information, May-July, 1945, he lost his seat at the general election in that year. A B.B.C. governor, 1946-49, he was elected Cons. M.P. for King's Norton 1950.



Edward Lloyd,
British singer
Elliott & Fry

Lloyd, HAROLD (b. 1893). An American film comedian. Born at Burchard, Neb., April 20, 1893, he went on the stage as a child and in 1913 entered the film studio of the Edison company, where he made his name in Lonesome Luke comedies directed by Hal Roach. In his many full-length silent comedies, e.g. *Safety Last*, *Hot Water*, *College Days*, *Speedy*, thrills and laughter were happily combined, and Lloyd's inevitable straw hat and horn-rimmed spectacles (a fashion he helped to popularise) became famous. His first talking picture was *Welcome Danger*, 1931; others were *Feet First*, 1931; *Movie Crazy*, 1933; *The Milky Way*, 1936; *Professor Beware*! 1938.

Lloyd, MARIE (1870-1922). An English music-hall artist. Matilda Alice Victoria Wood was born at Hoxton, Feb. 12, 1870. She first appeared under the stage name of Bella Delmere at the Eagle, City Road, London, in 1885, but soon became Marie Lloyd for the rest of her career. In the East End she made her first great success singing *The Boy I Love Sits up in the Gallery*. To the old Oxford and similar music halls she drew the town by her inimitable Cockney humour, ribald songs, and strident innuendoes. She finally established her claim to comic genius in pantomime at Drury Lane, 1891, and thereafter was the most popular comédienne of her time. Her renderings of *I'm One of the Ruins that Cromwell Knocked*



Marie Lloyd, famous English artist
of music hall and pantomime

About a Bit, and Oh, Mr. Porter were among the most brilliant low-comedy entertainments of the halls. Marie Lloyd married (1) Percy Courtney; (2) Alec Hurley (d. 1913), singer of coster songs; (3) Bernard Dillon, a jockey. Her generosity, especially to members of her profession, became proverbial. She died on Oct. 7, 1922.

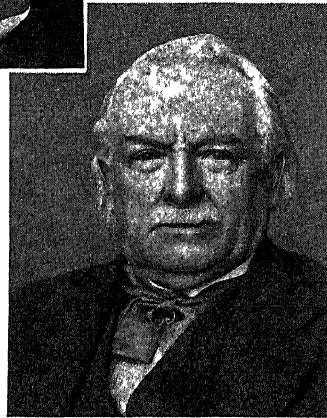
Lloyd, Sir William Frederick (1864-1937). Newfoundland politician. Born at Stockport, Cheshire, on Dec. 17, 1864, he emigrated to Newfoundland as a schoolmaster when 26, became a journalist and later a lawyer, and in 1904 was elected to the house of assembly. Chosen leader of the opposition in 1916, he formed a coalition ministry with Lord Morris in 1917; succeeding him as premier in 1918, he was made a privy councillor and knighted the next year. Lloyd represented his country at the imperial war cabinet and conference in London in 1918, and at the Paris peace conference. In 1924 he became minister of justice. He died June 13, 1937.



Lloyd Barrage. The irrigation scheme harnessing the Indus at Sukkur in Sind, Pakistan. It owed its inception in 1923 largely to the zeal of Lord Lloyd, then governor of Bombay. Completed in 1932, the scheme consists of a mile-long dam built across the river to form a reservoir from which water can be released to irrigate some 5,000,000 acres. Some 90 million cu. ft. of earth were excavated, 720,000 ft. of timber piles driven into the river bed, 12 million cu. ft. of masonry and three million cu. ft. of concrete used. The flow of water is controlled by 66 steel gates each 50 ft. wide and weighing 50 tons. Distribution of water to the surrounding country is made through seven main channels each 346 ft. wide; the total discharge into all canals being 285,000 gallons a second. Radiating from the main canals are 6,000 m. of channels and 30,000 m. of watercourses. Total cost of the scheme was £15,000,000.

Lloyd-George of Dwyfor, David Lloyd George, 1st Earl (1863-1945). British statesman. He was born Jan. 17, 1863, at Chorlton-on-Medlock, Manchester, where his father, William George, taught in a Unitarian school. Both his parents were of Welsh extraction. The father died when

David was only 18 months old, and he, with his sister and brother, were brought up by an uncle, a shoemaker, at Llanystumdwy, N. Wales. In 1879 he was articled to solicitors at Portmadoc, starting in practice for himself in 1884, first at Criccieth, then at Portmadoc. His name was soon known throughout the countryside, not only as a solicitor but as a forceful speaker on political questions, with a strong Radical bias. He achieved wider fame as a result of a legal action arising out of his advice, after an Anglican clergyman had refused to allow a Nonconformist to be buried in the churchyard, that the churchyard should be entered



David Lloyd George

"by force, if necessary." A county court judge decided against him, but the lord chief justice reversed the decision.

Lloyd George was returned to parliament as Liberal member for Caernarvon Burghs at a by-election in 1890, and remained its member for nearly 55 years. During the S. African war, in which he boldly pleaded the cause of the Boers, he became for a time the most popularly disliked man in the country. His anti-war meetings were broken up over and over again, and at Birmingham in 1901 he was obliged to leave a building disguised as a policeman. Yet eventually his courage served to increase public respect for him. He emerged as a coming leader of his party in opposition to Balfour's Education Act of 1902; and in Dec., 1905, Campbell-Bannerman, forming his new Liberal govt., appointed him president of the

board of trade. He was successful in that office, not only through his handling of railway and cotton disputes in 1907, but because of his original methods of administration, entailing the holding of round-table conferences to obtain the advice of outside interests. In April, 1908, Asquith, succeeding Campbell-Bannerman, appointed Lloyd George to follow him as chancellor of the exchequer. This office gave Lloyd George the opportunity to effect certain changes he had long advocated in the direction of greater social justice. His 1909 budget presented fresh proposals for raising money for such schemes. They included taxation of land values and coal royalties, new imposts on land, and super-taxation of large incomes. These proposals, which seemed to many to be revolutionary, were attacked with fury by the land-owning class. Lloyd George replied in an exceptionally violent speech at Limehouse, giving rise to a new term descriptive of the style of oratory he used there. It was the rejection of this budget by the house of lords, and the subsequent successful appeal of the government to the country, which led directly to the Parliament Act of 1911, modifying the lords' veto. Lloyd George's most important piece of legislation as chancellor of the exchequer, however, was the National Insurance Act of 1911, modelled on the German plan, which he had visited Germany to study in 1908.

The Coming of War

Another important event of 1911 was his Mansion House speech at the time of the Agadir crisis, a speech in which he surprisingly warned Germany that if Great Britain were to be "treated as of no account in the comity of nations, then peace at any price would be an intolerable humiliation." It was also his warning of the dangerous international situation, given in confidence to the leaders on both sides in the 1911 railway strike, which brought about a speedy settlement of that dispute.

Yet in July, 1914, when war threatened, he was the leader of the peace party in the cabinet. Only when Germany invaded Belgium did he support a declaration of war. But thenceforward no member of the government was more devoted to the Allied cause. He soon realized the paramount importance of munitions; and in the Asquith coalition govt. of 1915 he became, at his

own request, the first minister of munitions. Here and at the war office, where he succeeded Kitchener in July, 1916, he did most valuable work. His speeches at this time also heartened and encouraged the nation more than those of any other public man; and his skill in settling industrial disputes was of inestimable value.

War-time Prime Minister

Dissatisfaction with the Asquith regime grew during 1916. It was felt that more energetic and inspired leadership was essential to the successful prosecution of the war. A breach between Asquith and Lloyd George arose from the proposal to eliminate the former from control of a cabinet war committee. When Asquith insisted on his right to be chairman of such a committee, Lloyd George resigned. Asquith also resigned; and Bonar Law, sent for by the king, advised him to invite Lloyd George to form a ministry. This decision was well attuned to the desire of the vast majority of the nation; and from then until the end of the war Lloyd George was the embodiment of the British will to victory, and the forceful representative of that will in the councils of the Allied leaders. His responsibility was enormous, and many of his actions and judgments were open to criticism both at the time and later. He was assailed for his partiality to that strategy which sought ultimate victory on other fronts than the main western front. On the other hand, he was among the first to recognize the need for unified command on the western front and strongly supported the appointment of Foch to that command; and no critic could deny the immense advantage at all times of his dynamic driving force.

His personal popularity at large was demonstrated at the general election of 1918, when he was returned at the head of a coalition with a majority sufficient to give him unprecedented supremacy in political life for the next three years. His critics found fault with the methods by which his election campaign was fought, including his promises to "hang the kaiser" and "make Germany pay," and of a "land fit for heroes to live in."

At the Paris peace conference of 1919, as one of the arbiters of Europe's destiny, he was accepted as a statesman of world stature. He remained until 1922 the leading figure in all European conferences. But in Oct., 1922,

the Conservatives, who now formed the bulk of his supporters, revolted against his leadership and at a meeting at the Carlton Club decided to leave the coalition. Lloyd George resigned Oct. 19, after almost 17 years of continuous office. After the subsequent general election his supporters in the house numbered only 60, forming the smallest of the three opposition groups. The Asquith-Lloyd George breach was nominally healed for the 1923 election, but further party dissensions followed after the General Strike of 1926, and many Liberals showed their mistrust of Lloyd George's good faith, particularly resenting his retention of sole control over the coalition party funds. But the majority were by this time ready to accept his leadership. His last bid for political power, made in 1929 with a new land campaign, failed to win the electorate.

Last Years and Death

When MacDonald formed his all-party national govt. in 1931, Lloyd George was ill. Two groups of Liberals were originally represented in that govt. Lloyd George, in opposition, led a third group, derisively called a "family party" since it consisted only of himself and his son, daughter, and son-in-law. But as an elder statesman and "father of the house" he commanded wide respect. He spent much time on his farm at Churt, Surrey, and in writing his War Memoirs, 6 vols., 1933-36, the publication of which (after being serialised in *The Daily Telegraph*) aroused controversy by their outspoken criticisms of other war-time leaders, including the 1st Earl Haig. In the early months of the Second Great War, after the defeat of Poland, Lloyd George again caused pained surprise to many by his plea that the door should not be finally closed against the possibility of coming to terms with Nazi Germany. In 1940 there was hope that Churchill might persuade him to accept office again, and later that he might succeed Lord Lothian as ambassador to the U.S.A. But such overtures as were made came to nothing. In Jan., 1945, he was created an earl, but he died less than three months later, March 26, 1945, at his home, Ty Newydd, N. Wales. He was buried on the bank of the river Dwyfor.

The greatest orator and most vital political figure of his time, Lloyd George was awarded the O.M., 1919, and the grand cordon

of the Legion of Honour, 1920, besides honorary doctorates of the universities of Oxford, Wales, Sheffield, and Edinburgh, and the freedom of many cities. He married first, in 1888, Margaret Owen (d. Jan. 20, 1941), who was created D.B.E. in 1919; and secondly in 1943, Frances Stevenson, his private secretary. Two sons and two daughters of the first marriage survived him. The elder son, Richard Lloyd George, succeeded to the earldom. The younger was Gwilym Lloyd George (v.i.). The younger daughter, Megan, was M.P. for Anglesey from 1929.

Consult Life, M. Thomson, 1948; Letters, ed. by his widow, 1949. Unofficial biographies and studies include L.L.G., 1863-1914, W. W. Davies, 1939; and *The Man David*, J. Jones, 1943. *The Real L.L.G.*, A. J. Sylvester, 1947, is a portrait of the man as he appeared to his secretary. *Consult also* Dame Margaret, by the 2nd Earl Lloyd-George, 1947.

Gordon Stowell

Lloyd-George, GWILYM (b. 1894). A British politician. Younger son of the 1st Earl Lloyd-George, he was born Dec. 4, 1894, and educated at Eastbourne and Jesus College, Cambridge. He represented Pembroke-shire as Liberal M.P., 1922-24 and 1929-50. Secretary to the board of trade, 1931 and 1939-41, then to the ministry of food, he was minister of fuel and power 1942-45. In the 1945 election, though again standing as a Liberal, he declared his support for the Conservatives and was again returned. He failed to secure re-election in the 1950 general election.

Lloyd-George Expedition. An Anglo-Canadian-American expedition which in July, 1947, explored the Lloyd-George Range, one of the least known areas in N.E. British Columbia. Led by Frank Smythe, Everest mountaineer, the expedition made a sketch map of the area, ascending and naming three of the highest peaks of the range: Mts. David Lloyd-George, Criccieth, and Caernarvon. An icefield was found to extend, with glaciers, to over 60 sq. m. Also discovered was a remarkable stagnant glacier, believed to be the only one S. of Alaska. Aerial reconnaissance was carried out over the neighbouring ranges, including Mts. Churchill, Roosevelt, and Stalin, which were photographed for the first time. The Lloyd-George Range was named by a U.S. traveller, P. L. Haworth in 1916.

Lloydminster. A town on the border between Saskatchewan and Alberta, Canada, 170 m. E. of Edmonton and 200 m. W.N.W. of Saskatoon, on the C.N.R. and C.P.R. Founded by the Barr Colony, it was destroyed by fire in 1929 and has since been rebuilt. It is the centre of a grain-growing district which has twice won the world's championship for oats. Pop. 1,813.

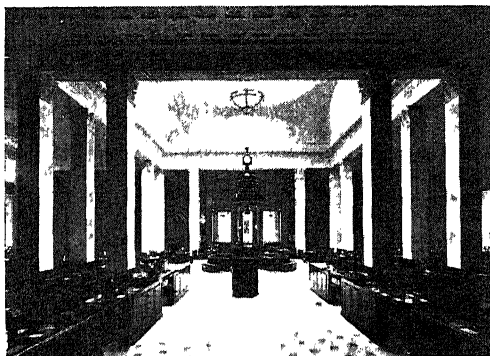
Lloyd's. The name of a world famous British corporation of underwriters. It originated in a coffee-house opened in Tower Street by Edward Lloyd before 1688. Men interested in shipping, meeting there for refreshment, found it useful for the transaction of business. In 1692, Lloyd moved to larger premises at the corner of Lombard Street and Abchurch Lane, and in 1696 issued Lloyd's News, a record of the movements of ships, for the convenience and information of his customers.

Within another year or two a number of these men formed themselves into an association for marine insurance. The old coffee-house premises were no longer adequate, and a move was made to rooms in the Royal Exchange. These in time being also outgrown, additional offices were acquired close by in the City; and in 1928 King George V opened a building which had been designed by Sir Edwin Cooper, with its main entrance in Leadenhall Street.

The association was reorganized in 1811, and in 1871 was incorporated by Act of parliament. There are more than 2,000 underwriting members represented in syndicates of from 10 to 80 names. Acting for these are 130 practising underwriters, able to give prompt decisions on all insurance submissions tendered by the brokers with whom the public deals. The reputation of Lloyd's was made by marine insurance (still an important part of the business transacted); but in 1907 Lloyd's wrote its first non-marine policy. An Act of 1909 legalised transaction by the corporation of non-marine business and Lloyd's eventually came to accept almost every

risk imaginable in human affairs, with the one notable exception of life insurance.

Lloyd's underwriters are free to transact business in the way each deems best. Membership is a jealously guarded privilege; and when opportunity for entry occurs, an acceptable candidate must give substantial proof of financial stability. Lloyd's has a system of shipping intelligence of unparalleled efficiency. It maintains signal stations in many parts of the world, and employs numerous



Lloyd's. The Underwriters' Room in the building opened in 1928 in Leadenhall Street
Joel

agents. Authoritative publications dealing with shipping affairs include the successor to Lloyd's News, the famous Lloyd's List and Shipping Gazette, probably the oldest daily newspaper in the world. In the London h.q. are housed the underwriting boxes, the "chamber of horrors," the casualty book, and the old Lutine bell (q.v.).

See Insurance; Lloyd's Register; Underwriter; consult also The History of Lloyd's, F. Martin, 1876; Lloyd's, London, E.C.3, published by Lloyd's, from The Bankers' Magazine, Oct., 1928; A History of Lloyd's, C. Wright and C. E. Fayle, 1928; Lloyd's, Historical Sketch, R. Straus, 1937.

Lloyds Bank. English banking company. Founded as a private bank, Taylor and Lloyd, in 1765, it had the usual existence of such banks until the commercial expansion of the 19th cent. Its early activities were mainly in Birmingham and district. The name was changed to Lloyds and Co. in 1853; incorporation as Lloyds Banking Co. Ltd. followed in 1865. In 1884 Lloyds took over the firms of Barnetts, Hoares & Co. and Bosanquet, Salt & Co., and became known as Lloyds, Barnetts, and Bosanquets Bank. In 1889 it took over the Birmingham Joint

Stock Bank and the Worcester City and County Banking Co., and adopted its present name.

In 1918 the Capital & Counties Bank, and in 1919 the West Yorkshire Bank, were taken over. During that period of amalgamations Lloyds acquired almost all the stock of the National Bank of Scotland, with 124 branches, and of the London & River Plate Bank, with 30. In 1911 it founded L'oyds Bank (France), now Lloyds and National Provincial Foreign Bank, which has branches in France and Belgium. In 1923 it acquired the business of Cox & Co., the army bankers. It is closely associated with the Bank of London and S. America. Head office, rebuilt 1930, is at 71, Lombard St., E.C.3.

Lloyds Bonds. A form of security named after the lawyer who was responsible for their wording. They were used by rly. companies when, in certain circumstances, they wished to borrow money, and in English law their value rests upon a legal fiction. The bonds could be issued by a company in payment of its debts, and as between the company and its creditors they were valueless, for the latter cannot recover interest or principal at law. If, however, a creditor sold them, the purchaser, having had no part in an illegal transaction, and having paid for the bonds, could be protected by law, and for him the bonds rested on good security. Use of these bonds was almost confined to rly. cos., because other concerns, owing to the arrangement of their capital, have usually a margin for borrowing by issuing debentures.

Lloyd's Medals. Awarded by the corporation of Lloyd's in recognition of gallantry at sea or

as a token of services rendered to the corporation. The medal for saving life at sea was instituted in 1836, and is issued in silver and bronze; in 1921 a special award in gold was made to Capt. Evans



Lloyd's Medal for saving life at sea

(Lord Mountevans) for his rescue of survivors from the Hong Moh off China. Suspended from a ribbon having a central red stripe flanked by white and blue stripes, it has on the obverse a scene from the Odyssey, with the inscription *Leucothoe Naufrago Succurrit*, and on the reverse a laurel wreath and the motto *Ob Cives Servatos sur-*

surmounted by the inscription "Presented by Lloyd's."

The medal for meritorious services was instituted in 1893 for ships' officers and others who distinguish themselves in saving vessels and cargoes. It is suspended from a blue and silver ribbon and is issued in silver and bronze. It carries on the obverse the corporation arms, and at the bottom circumference a floral spray of rose, shamrock, and thistle. The reverse has a wreath of oak leaves with a central scroll engraved "For Meritorious Services." In 1913 the medal for services to Lloyd's was issued for similar award. It is struck in gold, silver, and bronze, and the obverse carries a representation of Neptune in a four-horse chariot. The reverse and ribbon are the same as that of the medal for meritorious service, except that this inscription reads "For Services to Lloyd's."

In 1940 Lloyd's, with the approval of the Admiralty and the ministry of Shipping, instituted a war medal for bravery at sea, for award to officers and men of the merchant navy and fishing fleet who displayed exceptional gallantry. The obverse carries a figure symbolising courage and endurance with the inscription "Awarded by Lloyd's." On the reverse is a trident surrounded by a wreath of oak and laurel with the inscription "Bravery." The ribbon is blue and silver, similar to that for meritorious service but with the order of colours reversed.

Lloyd's Register of Shipping. Society concerned with the building of ships, and their maintenance in seaworthy condition, in order to qualify for classification. Cargoes are not the concern of L.R. (as the register is called by shipping men) except in so far as the society makes certain that ships are fit to carry their cargoes, with especial concern for such commodities as petroleum, oils, and refrigerated cargoes.

Lloyd's Register, in common with the corporation of Lloyd's (*g.v.*), perpetuates the name of Edward Lloyd, who provided at his 17th cent. coffee-house in the City of London written lists of ships likely to interest his customers. These lists developed into a printed register (afterwards known as the Green Book), dating from c. 1760 and sponsored by underwriters. In 1799 a similar register (known as the Red Book) was issued by a society of ship-owners. These two registers ran

concurrently until 1833, and they were absorbed into Lloyd's Register of British and Foreign Shipping formed in 1834. In 1949 the British Corporation of Shipping, formed by Scots shipowners in 1890 to assign loadlines, was merged with Lloyd's Register, the name being perpetuated in the full title: Lloyd's Register of Shipping united with the British Corporation Register. About 80 p.c. of the world's merchant shipping is classed by either the united society or the American Bureau of Shipping.

The society is controlled by a general committee composed of some 85 elected representatives of shipowners, underwriters, merchants, shipbuilders, marine engineers, and others. There are branch committees at Liverpool and Glasgow, and national committees in the U.S.A., Sweden, the Netherlands, Denmark, and Canada. The society's surveyors supervise the building of ships intended to receive the society's classification, and classes are assigned by the committee after examination of surveyors' reports. The highest class indicator, 100A1, is known throughout the world, and the term A1 of everyday usage is derived from it.

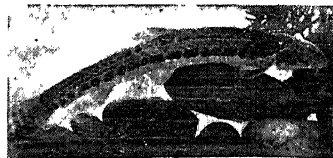
Lloyd's Register Tests

L.R., through its staff of qualified surveyors stationed at all the principal shipbuilding and shipping ports, undertakes much inspection work, including the testing of steel and other material for both marine and non-marine purposes. It is empowered by statute to superintend the testing of anchors and chain cables for use on British ships at the seven public proving houses in Great Britain and Northern Ireland, and is one of the bodies appointed to assign maximum loads to sea-going merchant ships.

The committee publishes annually Lloyd's Register of Shipping, Lloyd's Register of Yachts, and Lloyd's Register of American Yachts; also Rules for the Construction and Classification of Vessels and their Machinery, together with regular statistical information regarding merchant shipping and shipbuilding, total losses of vessels, etc. The society's headquarters is at 71, Fenchurch Street, London, E.C.3.

Liullailaco. Volcanic mountain peak of the Andes, S. America. It is situated on the borders of Chile and Argentina, between the provs. of Antofagasta, in the former, and Los Andes. It has an elevation of 22,000 ft.

Loach (Fr. *locher*, to fidget). Small fresh-water fishes of the carp family, of which the common loach (*Nemacheilus barbatula*) is the best known. A native of the greater part of Europe, it is common in shallow, gravel-bottomed streams



Loach. Specimen of the common loach found in Great Britain

in Great Britain, especially in the mountainous districts. The slender body is only 4 ins. in length. The back is dark green and the sides are yellow, the upper parts marbled with brownish-black. The squarish black fin is central, and the tail fin proportionately large. Scales are small and do not overlap. The upper jaw carries six barbels, four in front and one at each angle of the mouth.

Eaten immediately after capture the flesh is delicate and of good flavour, but the labour of catching sufficient for a dish is not a light one. An allied species, the spiny loach (*Cobitis taenia*), is found in England, but not in Scotland or Ireland. Its length is an inch less, and it is easily distinguished by the erectile spine placed in front of each eye.

Load. In mechanics, the forces acting on a member or a structure, due to superimposed weight. A distributed load is one distributed over the whole or part of a beam, etc. A concentrated load is one acting at a given point: its effect is twice that of an equal load distributed over the member. A live load is one suddenly applied, such as that of a vehicle coming suddenly on a bridge; or the effect of sudden wind pressure upon a roof. Its effect is twice that of a dead load, which is one gradually applied; or the load due to the weight of material on the member or to the weight of the member itself. In building construction the loading of different member or kinds of structure is governed by regulations and by-laws made by local authorities or professional institutions. (See Beam; Building.)

In engineering a load is the work imposed upon an engine, generator, or motor. The working load is the amount of work which it is designed to perform most efficiently under normal conditions; overload is a percentage over and above

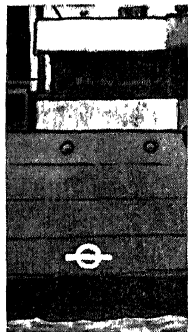
this to which it is tested, or to which it may be subjected under working conditions. If a generator be overloaded, the load may have to be reduced or shed by shutting down some of the circuits or paths through which its output is distributed to power consumers. The load factor of a power plant is the ratio of the power units actually generated in a given time to those which would have been generated had the plant worked continuously at its maximum output during the same period. The expression is also applied to the loading of vehicles, cranes, etc.

In aeronautics, the term useful load or disposable load is applied to the gross weight less the tare weight. The payload is that part of the useful load of a commercial aircraft from which revenue is derived (*i.e.* passengers, mail, or freight); the service load of a military aircraft is the weight of the crew and removable military equipment.

Loading. Term in aeronautics. The wing loading is the loaded weight of an aeroplane or glider divided by the net wing area; the power loading is found by dividing the loaded weight by the total power of the engine(s); surface loading is the mean force on a unit area carried by an aero foil under certain aerodynamic conditions.

For loading of substances in manufacturing processes, *see* Filler.

Load Line. Plimsoll mark carried amidships on each side of every British mercantile ship. It



Load Line, or Plimsoll mark

includes horizontal load lines showing the maximum depth to which she may be loaded in salt water, in fresh water, at different times of year, and in different oceans, etc. It is called the Plimsoll mark after Samuel Plimsoll, M.P., who, after intensive agitation, had its use made compulsory in 1876. Before its adoption many ships were lost through persistent overloading.

Loam. Soil consisting of a mixture of clay, sand, and silt. Loams vary considerably in the proportions of their constituents and are clay loams, sandy loams, etc., according to the predominating one. *See* Clay; Sand; Soil.

Loan (O.E. *lān*). In popular language, money lent. More exactly, the delivery of a thing to a person for his temporary use or consumption, the thing to be either returned or repaid (if, say, money or a commodity such as tea). The ordinary law applies to loans, except those to infants and by moneylenders. If a loan is not subject to special agreement, the borrower is bound to return the thing lent, or if that is not possible, to pay its value; but the lender has to recoup the borrower for extraordinary cost incurred: for example, if a veterinary surgeon has to attend a borrowed horse. The thing must be returned in as good condition as when it was borrowed, fair wear and tear excepted. Loans of money are often secured by the deposit of articles of value or documents of title (such as bills of lading, stock or share certificates, and deeds relating to land), and may involve a charge or a mortgage. (*See* Moneylender; Mortgage; Pawnbroker; Pledge.)

PUBLIC LOAN. This is money borrowed by a govt. or a local govt. authority such as a bor. council or a C.C. Most of the money required by local authorities for such purposes as large-scale building, where the expenditure is very great in proportion to the rateable value of the area, and the assets to be acquired will remain in use for a number of years, is usually obtained by loans, either direct from the public or from the public works loan board, established in 1817 for the purpose of advancing money to mun. authorities. Interest and the annual sinking fund instalment towards the repayment of the loan are paid out of the authority's income from rates levied. At the end of 1947 the total of local loans in the U.K. was more than £2,000,000,000. The property owned by local authorities is considerably in excess of this amount.

Loans to govts. have been made principally to facilitate either preparation for war or the waging of war. The balance outstanding at any time constitutes the nation's national debt, and represents chiefly the amount by which the cash payments incidental to wars have not been met out of the taxes levied during the wars. Great Britain's national debt began with the loan of £1,200,000 to William III to continue the war against Louis XIV. The national debt had

grown by March 31, 1914, to £706,000,000; by March 31, 1921, it had increased to £7,634,000,000. On March 31, 1939, it was £8,301,000,000. Six years later it was £22,541,000,000. (*See* Sinking Fund.)

INTERNATIONAL LOAN. This is a credit from one national govt. to another. During the First and Second Great Wars Great Britain borrowed a part of the cost of munitions, etc., from other countries. In 1939 she owed £1,032,000,000 to other countries, principally for loans contracted during the First Great War. On June 30, 1945, she owed to other countries £3,355,000,000, including £1,732,000,000 due to India, Burma, and countries of the Middle East. She had incurred this overseas indebtedness in spite of a gift from Canada of food, munitions, and raw materials worth \$1,000,000,000, the sale abroad of £1,118,000,000 of British overseas investments, and the institution of Lease-Lend (*q.v.*).

Great Britain's industry had during the war been wholly devoted to the production of materials of war, and when lease-lend was suddenly terminated in Aug., 1945, was not in a position immediately to produce exportable goods. This, and the sale in the early part of the war of her overseas investments, left her unable to pay for essential imports from the U.S.A., the only country able to supply them. The British asked the U.S.A. for a loan. After protracted negotiations in which Lord Keynes (*q.v.*) played a leading part, an agreement was reached in Dec. It granted to the British govt. a loan of \$4,400,000,000 of which \$650,000,000 was a final sum in settlement of lease-lend and \$3,750,000,000 was a credit to be drawn upon at any time between ratification and Dec. 31, 1951. The loan was to be repaid over a 50-year period beginning Dec. 31, 1951, with interest from that date at two p.c. per annum, except during years when G.B.'s income from home produced exports and invisible current transactions was less than the average annual amount of U.K. imports during 1936-38. The British govt. undertook to discuss with its other overseas creditors the adjustment of the principal of its debts to them, and the means by which their balances of sterling might gradually be made convertible into any other currency: to ratify the agreement

of Bretton Woods (*q.v.*); and to cooperate with the U.S. govt. in the establishment of an International Trade Organization (*q.v.*, under N.V.).

The British parliament ratified the loan agreement by the end of the year; the U.S. congress ratified it July 13, 1946, after a stiff fight in both the house of representatives and the senate.

The credit was drawn on during 1946 and 1947 far more rapidly than the negotiators had anticipated. This was partly because of steeply rising prices in the U.S.A. and partly because when in July, 1947, sterling in respect of current transactions became freely transferable into dollars a number of nations took advantage of this in order to secure U.S. goods; between July 1 and Aug. 20 the British govt. had to provide \$275,000,000 in New York. The British govt. was forced to suspend the convertibility of sterling into dollars Aug. 21, on which day the balance of the loan, \$400,000,000, remaining on Aug. 29 was "frozen" by the U.S.A. until Dec. 4. At the end of the year \$300,000,000 only remained, and this was exhausted in Feb., 1948.

In 1942 Canada agreed to convert £700,000,000 sterling balances which had accumulated in London into a Canadian dollar loan, interest free, during the war. In March, 1946, Canada made a new financial agreement with G.B. for a loan of Canadian \$1,250,000,000 and the mutual settlement of all remaining war claims by a payment of G.B. to Canada of \$150,000,000. The interest-free loan of 1942 was renewed until January 1, 1951. Repayment in 50 instalments of the new loan with interest at two p.c. per annum was to begin Dec. 31, 1951, interest being waived in certain agreed circumstances. Canada thus made available to G.B. free cash equivalent to more than a quarter of that afforded by the U.S. loan, although her national income is less than one-twentieth of that of the U.S.A.

One nation can lend to another (a) by permitting the borrower to defer payment for goods previously supplied by the lending country; (b) by supplying goods to the borrower to be paid for later; (c) by transferring to the borrower some of the lender's right to receive goods from other countries in payment for goods previously supplied to them by the lender; (d) by transferring to

the borrower some of the lender's money, so that the borrower may transfer this to other countries in payment for goods supplied by them, these countries in turn exchanging the money for goods supplied by the lender. Although expressed in the first place in terms of money, all international loans involve the supply of goods

ments, Balance of; Sterling. For details of the Financial Agreement with the U.S.A., Dec. 6, 1945, consult Cmd. 6968, H.M.S.O., 1946.

Loanda or **LUANDA**, SÃO PAULO DE. Capital of Angola, W. Africa, and the residence of the governor-general. It is situated on a small bay about 210 m. S. of the mouth



Loanda, West Africa. The commercial part of the capital of Angola borders the harbour, while the official buildings are on the cliffs above

to the borrower or to some other nation nominated by the borrower (gold is included in "goods"). Consequently, one nation can lend to another only when it is in a position to export more goods than it imports.

Conversely, a lender nation can receive interest or repayment of principal from a borrower nation only when it is prepared to import more goods than it exports, or is prepared to lend further, or to invest in the borrower's country or elsewhere abroad. During the years between the First and Second Great Wars the U.S.A. was not willing to receive goods, other than gold, to an amount sufficient to enable European nations to pay interest and to repay the principal of loans made after the 1914-18 war. In 1947 U.S. exports were about \$30,000,000,000 more than U.S. imports. At that time there was such a shortage of goods that the receiving nations could not send the U.S.A. goods in exchange for those excess imports. It will, however, not be possible for the nations to whom the U.S.A. lent such considerable sums in 1946 and 1947 to pay interest on the loans or to repay the principal unless the U.S.A. adjusts its trade policy so as to permit a surplus of imports sufficient to offset the surplus of exports of recent years, or unless the U.S.A. decides to invest overseas amounts due to it as interest and repayment of principal. See Bretton Woods; National Debt; Pay-

of the Congo, and is one of the oldest of the Portuguese settlements in W. Africa, the fort dating from 1575. A rly. has been constructed to Malanje (312 m.). Loanda also forms the capital of one of the five provs. into which Angola is divided. It exports coffee, rubber, coconuts, etc., and has sugar and tobacco factories. Pop. 23,000.

Loango. Region of West Africa, extending along the coast N. of the river Congo. It was divided by the Berlin Conference of 1885 among the Congo Free State, Portugal, and France. The French portion forms a district of the Gabun Colony and is termed Kwilu, while the Portuguese section is the Cabinda or detached portion of Angola called Kabinda.

Loango. Capital of the dist. of Kwilu in the Gabun colony, French Equatorial Africa. It is a port in the S. of the country, though steamers must anchor 3 m. off shore. A rly. runs from Brazzaville to Pointe Noire, S. of Loango.

Loangwa or **LUANGWA**. River of N.E. Rhodesia. It rises in the highlands N.W. of Lake Nyasa and flows S.S.W. to the Zambezi at Feira and Zumbo, forming there the boundary between Mozambique and Rhodesia.

Loan Society. An institution established to lend money at interest to the industrial classes and receive repayment by instalments. Such societies are governed by the Loan Societies Act, 1840, which requires them to frame rules in accordance with its terms. These rules specify the interest

they charge, which must not exceed £12 p.c. and which they may deduct by way of discount at the time of making the loan, and the amount of the instalments.

They may make a loan not exceeding £15 to any borrower, and can grant no second loan until the first has been repaid. The Act provides a form of note to be signed by the borrower and two sureties, and in default of repayment the person liable may be summoned before any justice of the peace, who may levy by distress and sale. Loan societies are exempted from the provisions of the Money Lenders Acts. See Moneylender.

Lobby. Word meaning a waiting-room or passage, the idea being that it leads to a more important apartment. In a special sense it is used for the entrances to the houses of lords and commons at Westminster, and to those of other legislative buildings; also for the two corridors through which members of parliament pass in order to record their votes. One of these is called the aye lobby and the other the no lobby. See Division.

Lobbying. Term used for the practice of calling upon members of a legislative assembly, e.g., the house of commons, in the lobby for the purpose of securing their support for a certain measure. It originated in the U.S.A., and the men who practised it were known as lobbyists.

Löbe, PAUL (b. 1875). German politician. Born Dec. 14, 1875, at Liegnitz, he was at first a typesetter, and at 24 became editor of the Breslau Socialist daily paper. Elected to the Reichstag, he was from 1920 its president until ousted by the Nazis' success in 1932. Imprisoned and ill-treated in concentration camps, he survived to play an active part in the post-war Socialist movement in Berlin.

Lobelia. Genus of hardy and half-hardy perennial and annual plants, of the family Campanulaceae. They are natives of tropical and temperate regions. The genus



Lobelia. Leaves and flowers of the blue dwarf variety

the soil is heavy and moist, and stored in a cool greenhouse. The familiar blue dwarf lobelia, used as an edging and carpet plant for summer bedding, is *L. erinus*. It is a native of S. Africa. This species and its varieties are sown in early spring in boxes, and kept at a temperature averaging 50°. The young plants will be ready for bedding out in May or June.

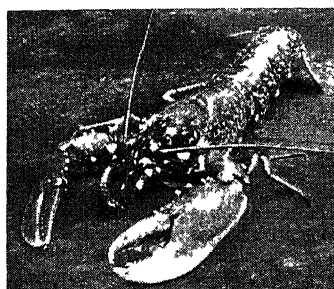
Lobelia inflata, or Indian tobacco, long a domestic medicine of the N. American Indians, yields an alkaloid, lobeline (C₂₂H₂₇O₂N), which has an action closely resembling that of nicotine. It stimulates the respiration and has been used to revive patients who have had an overdose of a narcotic drug.

Lobengula (c. 1833-94). Matabele king. Succeeding his father in 1870, he exhibited violent animosity towards Europeans, a sentiment which was increased after his dealings with the Portuguese, who attempted to obtain his territories after the discovery of gold in 1872. He accepted the protection of Great Britain in 1888, but, conceiving himself affronted by the British South Africa Company, he revolted five years later. His forces were finally dispersed in a battle near Bulawayo, Dec., 1893, and he died shortly afterwards.

Lobito Bay. Harbour situated a few m. N. of the port of Benguela, Angola. One of the finest harbours on the W. coast of Africa, it is formed by a remarkable spit of sand, 3 m. in length, projecting into the sea and running parallel with the mainland. Here the largest vessels can anchor within 30 ft. of the shore. Lobito Bay is the starting point of the Benguela rly., which crosses the country into the Belgian Congo.

Lobos OR SEAL ISLANDS. Two small groups of rocky islands in the Pacific Ocean. They lie off the coast of N. Peru, 12 m. W. of the prov. of Lambayeque. The largest, Lobos de Tierra, in the N. group, is about 5 m. long by 2 m. broad. Lobos de Afuera lies about 25 m. S. of it. The rich deposits of guano are rapidly being exhausted.

Lobster (a corruption of Lat. *locusta*, spiny lobster; cf. Fr. *langouste*). Name given to several species of decapod (ten-footed) crustaceans. With pincer-like limbs on the thorax, they are com-



Lobster. Specimen of the common variety, *Homarus gammarus*

monly distinguished from the crab-like forms by the possession of a large cylindrical tail. The crayfish, Norway lobster, prawn, and shrimp belong to the same sub-order (*Macrura*), but the name is usually restricted to *Homarus gammarus*, the common lobster of the markets, and to *H. americanus*. In this species the carapace is almost cylindrical, and is bluish-black in colour, the familiar red hue being the result of boiling. Good specimens weigh from 8 lb. to 11 lb. They are found among the rocks around the coasts, where they live in holes when not wandering in search of food. The eggs are carried by the female attached to the swimmerets, and hatch out into minute free-swimming larvae. See Arthropoda; Crab; Crawfish.

Lo b Worm OR LUG WORM (*Arenicola marina*). A species of marine worm, largely used in sea fishing. It somewhat resembles a dark brown or greenish earthworm with thirteen pairs of branched red gills along the sides of its segmented body. It is common in the muddy sand between tide marks, where its burrows may be recognized by the heaps of casts. A favourite food with ground feeding fish, it is much used as bait.

Local Government. Term for carrying out in defined local areas by bodies subordinate to the national govt. of functions delegated to them by the national govt. The system in operation in a particular country will generally be found under that country (see e.g., England; France; Netherlands; Scotland; U.S.A.). The multiplicity of functions of such authorities is indicated by the following list showing distribution of responsibility among the various bodies exercising local government in England:

IN RURAL DISTRICTS:

(1) *Parish Councils*: Maintenance of parish property; administration of lay charities; safeguarding sanitary conditions;

maintenance and repair of footpaths; protection of boundaries, rights of way, and commons; appointment of school managers; provision of allotments and baths; libraries (acquired up to 1919); tramway orders; utilisation of water resources; representation on rating authority; rating and valuation appeals; securing extra postal facilities; assistance to harbour authorities; street lighting, burials, and public improvements; war memorials; recreation grounds.

(2) *Rural District Councils*: Rating and valuation; public health (sanitary services); building by-laws; baths and wash-houses; parks and open spaces; cemeteries and crematoria; markets; protection of rights of way and commons; housing; small dwelling advances; water supply; ferries and light railways; licensing *e.g.* of game dealers; control of fairs; postal facilities; assisting harbour authorities; application for a charter of incorporation.

(3) *County Councils*: Administration of justice; standing joint committee for police; public assistance; public education; libraries (if established after 1919); blind welfare; shops act inspections; food and drugs act; regulation of advertisements; inebriates reformatories; fabric misdescription prevention; housing rural workers; highways and private streets; care of ancient monuments; agriculture and small holdings; open spaces; ferries and light railways; fire brigades; town and country planning; local health services (health centres, care of mothers and children, health visiting, home nursing, community care in the mental health service, vaccination and immunisation, ambulances, home helps); aerodromes; registration and licensing, *e.g.* of motor cars; destructive insects and pests; diseases of animals; appointment of coroners; weights and measures; explosives; sea fisheries.

IN URBAN AREAS:

(1) *Urban District Councils*: As for rural district councils; stopping or diversion of roads; provision of allotments; appointment of school managers; tramway orders; street lighting; libraries and museums (if acquired before 1919); fabric misdescription prevention; highways and private streets; aerodromes; regulation of advertisements (10,000 pop.); war charities registration (15,000 pop.); shops act administration (20,000 pop.); education divisional executive (60,000 pop.); offensive trades control; building and improve-

ment lines; weighing machines; advertising amenities; esplanades and piers; gas supply; stipendiary magistrate (25,000 pop.); food and drugs act administration (40,000 pop.).

(2) *Borough Councils*: As for urban district councils; mayor aldermen, and borough auditors; licensing inebriates retreats; care of ancient monuments; separate commission of the peace.

Destructive insects and pests, diseases of animals, borough quarter sessions, borough coroner, weights and measures, explosives (10,000 pop.).

Sea fisheries (20,000 pop.).

(3) *County Boroughs*: All powers of borough councils and county councils.

Local Government Board.

Department of the British government created in 1871 to take over work mainly connected with public health and with the administration of the poor laws, which had previously been distributed between the poor law board, the Home office, and the privy council. In 1919 it was superseded by the ministry of health in England and Wales, and in 1929 the Scottish board of health was set up under the secretary of state for Scotland. The president of the local government board was a minister of cabinet rank, with a salary of £2,000 a year raised in 1909 to £5,000.

Local Option. Term meaning that a locality, town or county or other area, is given the power to decide what course it shall take on a given question. The idea is that the supreme legislature, instead of making a certain course of action compulsory, leaves it to the inhabitants of the various localities to decide upon its adoption by vote. It is not quite the same as permissive legislation, which means that an elected body can put into force an Act of Parliament or not, as it chooses. Nor must it be confused with a referendum, such as was taken in New Zealand in 1919 on the question of prohibiting the sale of intoxicating liquor.

The term is usually confined to questions affecting the sale of intoxicating liquor and was known at first as local veto. The temperance party in the U.K. advocated it, as they did elsewhere, without success. In Canada in 1898 a law allowing something of the kind was passed. In Australia and the U.S.A. some states were allowed local option in this matter, but this was superseded in the latter by the adoption of prohibition under the Volstead Act. The

Scottish Temperance Act, 1913, provided for local option throughout that country. It came into force in 1920. There was voting in 572 areas, but the great majority (496) decided for no change. See Licensing Laws.

Local Taxation. Term used for money raised by local authorities from the owners and occupiers of property in their areas. In the U.K. this form of revenue is generally called rates. Local taxation grants until 1889 were made from the national exchequer to local authorities to compensate them for sums spent on items that were properly of national concern. The Local Government Act, 1888, abolished these grants and instead provided that sums collected on local taxation licences in every county should be paid into an account at the Bank of England which was applied for the benefit of local authorities. The licences referred to included those for retailers of and dealers in intoxicating liquor; of game-dealers; for dogs, carriages, armorial bearings, and male servants. By later Acts a portion of the customs and excise duties, estate duty, and duties on road vehicles were added. The Local Government Act, 1929, substituted for these grants a general exchequer contribution.

Local Time. Time calculated on the basis that at 12 noon the centre of the sun is due south. Sundine recorders and sundials indicate local apparent time (L.A.T.). Because the orbit of the earth is elliptical and, at the same time, the axis is tilted out of the line at right angles to the orbit, there would be a slight variation in the length of the solar day if no correction were applied. This variation in length with the time of the year is obviated by considering a "mean sun" rather than the true sun, the transit times being denoted local mean time (L.M.T.), which in the middle of Feb. is 14½ mins. faster and at the end of Oct. 16½ mins. slower than L.A.T. The difference between L.M.T. at two places at the same instant depends only on difference in longitude. In 24 hours the earth rotates through 360° relative to the sun, i.e. 1° of longitude is equivalent to 4 mins. Hence the L.M.T. for any place is calculable from Greenwich mean time. See Time.

Locarno. Town of Switzerland, in the canton of Ticino. It stands at the N. end of Lake Maggiore, 13 m. by rly. W. by S. of Bellin-



zona. The old castle of the Visconti, ruined after 1518, is now a law court and prison. On a hill stands the pilgrimage-church of Santa Maria del Sasso, founded in 1569. Italian in architecture and population, Locarno was taken from Milan by the Swiss in 1803. For the treaty of 1925, see below. Pop. 7,500.

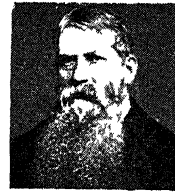


Locarno, Switzerland. Market place in this picturesque town on Lake Maggiore. Top picture, old church of Santa Maria del Sasso, a place of pilgrimage

Locarno, TREATY OF. European peace pact. Concluded on Oct. 16, 1925, between Belgium, France, Germany, Great Britain, and Italy the treaty provided for the maintenance of their existing mutual frontiers and abstention from the use of force against one another by Belgium, France, and Germany. Germany recognized the demilitarisation of the Rhineland. Great Britain and Italy assumed the part of guarantors; and mutual assistance was provided for in the event of violation. The pact was broken in 1936 when Germany reoccupied the Rhineland, but British obligations to France and those of both countries to Belgium were renewed subsequently. Among signatories were Austen Chamberlain for Great Britain, Briand for France, and Stresemann for Germany.

Loch. Name given to Scottish lakes, as well as to the long, narrow almost land-locked arms of the sea. Sea lochs are the drowned lower valleys of rivers formed by the sinking of the land. This sinking admitted the sea to valleys carved out by running water, and often deepened by glacial action. See Lake; Scotland.

Loch, HENRY BROUGHAM LOCH, 1st BARON (1827-1900). British administrator. Born May 23, 1827, after two years in the navy he became an officer in the service of the East India Co., and served against the Sikhs. In the Crimean War he organized a force of Turkish cavalry in Bulgaria. A member of missions sent to China in 1857 and 1860, he was for some time a prisoner of the Chinese. In 1863 he was made governor of the Isle of Man; in 1880 K.C.B.; in 1882 commissioner of woods and forests; in 1884 governor of Victoria. He governed Cape Colony, a zealous supporter of Rhodes's expansionist

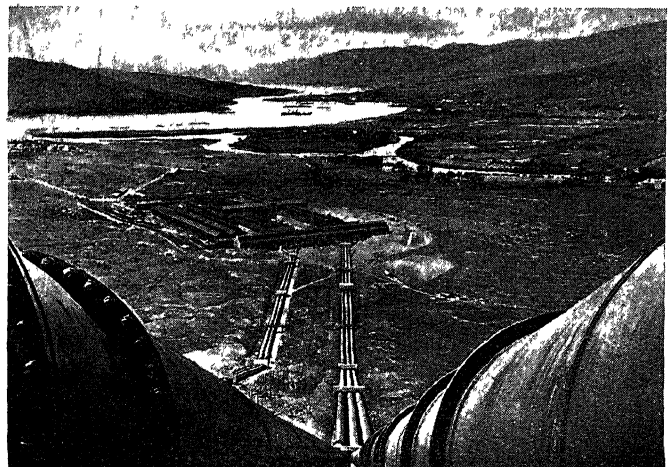


1st Baron Loch, British administrator
Elliott & Fry

entered the army in 1893. He served with distinction in the Sudan, the S. African War, and the First Great War, reaching the rank of major-general. He was captain of the king's bodyguard of the yeomen of the guard, 1924 and 1929-31. Dying Aug. 14, 1942, he was succeeded in the peerage by his son George (b. Feb. 3, 1916).

Lochaber. Rugged and mountainous district of Inverness-shire, Scotland. In the neighbourhood of Lochs Linnhe, Leven, and Eil, it is about 35 m. long and 20 m. broad. The Lochaber axe, formerly a Highland and Irish weapon, was a bill with a hook at the back.

The Lochaber hydro-electric power undertaking was inaugurated in 1926. It includes two major dams, one containing the waters of Loch Treig and the other those of Loch Laggan. The water is conveyed through a 15-m. tunnel, 15 ft. in diameter, to the power station at Fort William. This largest tunnel in the British Empire was blasted through the granite of the Ben Nevis range. All the dams together form a catchment area of 300 sq. m. with a water storage capacity of 9,300 million cu. ft. The largest, at Loch Laggan, is 700 ft. long and 170 ft. high. The tunnel terminates on the mountainside, whence water is carried in steel pipes to the power station. Turbines here have a



Lochaber, Scotland. Hydro-electric aluminium reduction works, seen from the exit of the Ben Nevis tunnel; beyond are Loch Linnhe and Fort William (right)

Photo, British Aluminium Co., Ltd.

potential h.p. of 100,000 and generate energy for the manufacture of aluminium in electric furnaces. The undertaking was completed in 1936 at a cost exceeding £6,000,000.

Lochearnhead. Village of Perthshire, Scotland. Situated at the head of Loch Earn, it is 14 m. by rly. N. of Callander, and near the Rob Roy country around Balquhither.

Loches. Town of France, in the dept. of Indre-et-Loire. It stands on the Indre, 30 m. S.E. of Tours. Its interest is wholly historical. The castle, which still stands on a hill above the town, consists of the old donjon or keep, and a more modern residence built by Charles IX. In the former are the donjon proper, dating from the 12th cent., a prison, and the round tower containing the famous cages in which Louis XI placed some noted prisoners. Within the castle walls, which are over a mile round, is the church of S. Ours, dating from the 10th cent. It belonged to a monastery, founded by S. Ours. For about 200 years the castle was a residence of the French kings.

There are a town hall built in the 16th cent., some old houses, and some modern buildings. The great tower of S. Antoine is the remains of a 16th cent. church, and one of the town gates still stands. The town has a trade in agricultural produce. Loches was a Roman settlement and had a monastery in the 5th cent. In the 9th it became the property of the Plantagenet family and so of the king of England, but was taken from John about 1206. The ruined abbey of Beaulieu lies across the Indre.

Lochgelly. Police burgh of Fife, Scotland. It stands near Loch Gelly, 7 m. N.E. of Dunfermline, with a rly. station. The staple industry is coal-mining. Loch Gelly is nearly a mile long and $4\frac{1}{2}$ m. wide. Near the town, which is of modern growth, are some historic spots. Pop. 9,297.

Lochgilphed. Burgh of Argyllshire, Scotland. At the head of Loch Gilp, a branch of Loch Fyne, it is 19 m. S.W. of Inveraray. It has a small trade in cattle. Pop. 1,150.

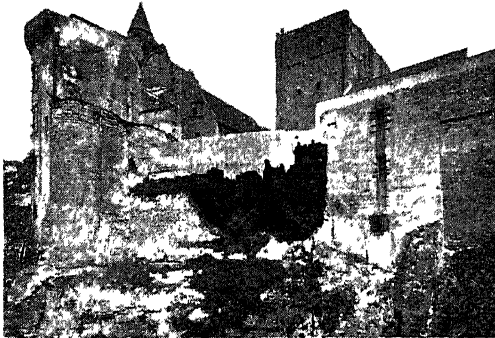
Lochmaben. A royal burgh of Dumfriesshire, Scotland. It stands on the Annan, 8 m. N.E. of Dumfries, with a rly. station. The chief buildings are the parish church and the town hall. Largely rebuilt in recent years, it is a holiday centre, also the focus of an agricultural district. Around are a number of lochs, in two of which is found vendace, a fish that occurs nowhere else in the British Isles. The ruins of Lochmaben Castle stand on a peninsula in Castle Loch. This was the home of the Bruces, and King Robert may have been born here. Lochmaben received a charter from James I in 1612, but it was a royal



Lochmaben, Dumfriesshire. The loch and ruins of the castle, once the home of the Bruces
Valentine

Lock. Chamber in a navigable waterway, provided with watertight entrance gates at each end, by means of which boats are enabled to pass from one water level to another. To transfer a boat from high to low level the gates at B, in diagram, are closed, and water is admitted through sluices until it has risen within the lock to the higher level. The gates at A are then opened, the boat enters, and they are again closed. Water is then discharged through another set of sluices until it has fallen in the lock to the lower level, when the gates at B are opened, and the boat is free to pass out. By reversing the process a boat may be lifted from low to high water level.

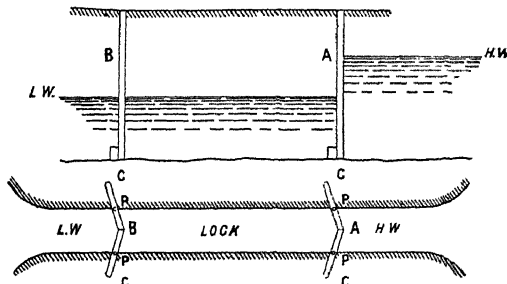
Sluices are fitted either in the gates or in the walls, and may be operated by hand gearing or by power. In small locks the gates are opened and closed by long levers, or balance beams, secured to the tops of the gates, the gate revolving on the pivot; in large locks they are operated by power-driven machinery, the balance end of the lever or beam being left off. The dimensions of a lock must be sufficient to accommodate the largest boats likely to use the waterway, with an ample allowance to permit of the gates B being opened inwards. Gates for small locks are usually of timber, those of a large size of steel or steel and timber. As they have to sustain pressure due to a head of water above or within the lock, they are of strong construction, and arranged so that



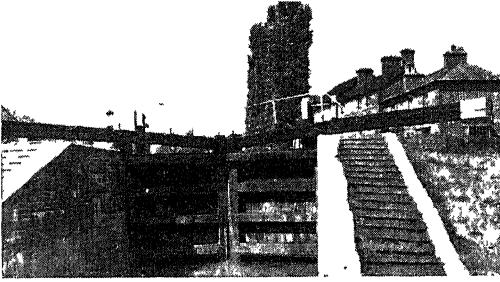
Loches, France. Ruins of the castle. On the left is the round tower of Louis XI, in the centre the ancient donjon

burgh before 1190. Market day, Mon. Pop. 1,014.

Lochy. Loch or lake of Inverness-shire, Scotland. Part of the Caledonian Canal, it is drained by the river Lochy to Loch Linnhe. The lake, 10 m. from N.E. to S.W., has salmon and trout fisheries.



Lock. Diagrams illustrating river or canal lock. Top, section; bottom, plan. A. Gate at high water level, HW. B. Gate at low water level, LW. C. Levers, and P, pivots, of gates



when closed they meet at an angle, or in the form of an arch, the bottom of the lock being cut away to form a sill against which the gate rests, the water pressure keeping the joints tight.

A gangway is frequently provided across the gates, especially where sluices are operated by hand wheels from the gate tops. The walls are usually of concrete, sometimes with blue brick facing, the larger locks often having vertical timber fendering them, and when the gates and sluices are closed form a watertight chamber.

Locks are an important factor in the canalisation of rivers and in the construction of canals. They are sometimes placed between two docks or in a dock entrance, where they serve to extend the limited time before and after high water, during which vessels can effect entry or exit. They vary greatly in size, from those for small craft on upper reaches of rivers, to locks which accommodate very large ocean-going vessels, such as the great locks on the Panama canal, measuring 1,000 ft. long by 110 ft. wide, with a lift of 30 ft. See Canal; Dock.

Lock. Device commonly comprising a sliding bolt shot by a key, which, however, may be dispensed with, for securing in a closed or other position a box-lid, door, or other contrivance. The simplest modern form is the common spring lock, usually fitted with wards or wheels designed to minimise the risk of the lock being operated by a false key.

There are three principal types of lock. Pivoted levers or tumblers, as in the Chubb lock, are those in which spring-pressed tumblers, each formed with a gate, are lifted

by the key to such positions that the gates all register simultaneously to permit the passage through them of a pin on the bolt, and thus the shooting of the bolt.

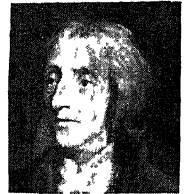
Combination locks used for se-

ing notches, and the bolt is free to be moved. The positions of the disks, and also of the pins, may be altered at will to correspond with the different characters on the dial, thus changing the combination. This is sometimes known as a permutation lock, since the number of combinations is limited only by the law of permutations as applied to the number of disks and the number of characters on the dial.

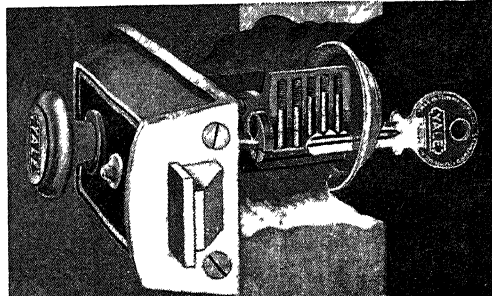
Revolving plugs, as in the Yale lock, comprise a series of spring-pressed pins raised by a flat key with a serrated edge to permit the rotation of a barrel carrying a cam for shooting the bolt. The Yale lock has a keyway with continuous longitudinal fluting.

Locke, JOHN (1632–1704). English philosopher, born at Wrington, Somerset, Aug. 29, 1632. His father was a lawyer and for a time a soldier in the parliamentary army. John was educated at home, at Westminster School, and at Christ Church, Oxford. He became a tutor at Christ Church, and there studied science, especially medicine and meteorology, also practising as a physician. In 1666 he became private secretary to the earl of Shaftesbury, with whose political career he was associated for nearly 15 years, being secretary of the board of trade during 1672–75. Thence until 1679 Locke was in France. In 1683, out of sympathy with affairs, he crossed over with Shaftesbury to Holland. He became known to William of Orange, and in 1689 returned to England.

About this time Locke began his career as an author, and in 1690 appeared his *Essay concerning Human Understanding*. He defended his theories against attacks made thereon, and to the 4th edn., 1700, added the memorable chapter on the association of ideas. He held a minor office in the public service, but most of his time was passed at Oates, near



John Locke



Lock. Sectional diagram of Yale lock, showing operation of pin-tumblers on insertion of key

High Laver, Essex, in writing and in converse with his friends, who included some of the leading thinkers of the day. He died Oct. 28, 1704, having given his last years to work on the Epistles of S. Paul.

As a philosopher Locke is the originator of modern materialism and empiricism. In the Essay concerning Human Understanding, in which his theory of knowledge is expanded, he denies the existence of innate ideas, and asserts that the source of all knowledge is experience. The mind of man is at first a blank page (*tabula rasa*), on which experience inscribes the impressions of the senses. There is nothing in the intellect which was not already in the senses. Sensation is succeeded by reflection (internal perception), which becomes another source of our ideas. Secondly, external objects having furnished the mind with ideas (yellowness, whiteness, heat), the mind reflects upon itself and receives another set of ideas concerned with its own operations, which could not be had from things without; such operations are perception, thinking, doubting, believing, reasoning, and all the different activities of our own minds. The cooperation of sensation and reflection gives the ideas of power, unity, succession, pleasure or pain, etc. The combination of these simple ideas produces complex ideas. Simple ideas are the letters, complex ones the syllables and words, of knowledge, which is itself limited by the extent of our experience.

As a political philosopher Locke enunciated the Whig theory of government. His ideas are contained in Two Treatises on Government, in which he states the case for the ultimate sovereignty of the people, which is the basis of all democratic government. His Letters concerning Toleration, four in number, are arguments for liberty of thought. Written in Latin, the first appeared anonymously in 1689. Locke's other writings include Thoughts concerning Education, 1693; and The Reasonableness of Christianity, which involved him in controversies. He also wrote on monetary subjects. See Government; Sovereignty; *consult* Lives, H. R. Fox-Bourne, 1876; T. Fowler, 1880; A. C. Fraser, 1890; R. I. Aaron, 1937; Critical Study, S. Alexander, 1908.

Locke, WILLIAM JOHN (1863-1930). British novelist. Born in Barbados, March 20, 1863, he

became a schoolmaster, and later secretary of the Royal Institute of British Architects. Turning to literature, he produced successful novels, mostly dealing with well-to-do people, marked by careful craftsmanship and whimsical sentiment. His first was *At the Gate of Samaria*, 1895. Others include *The Morals of Marcus Ordeyne*, 1905; *The Beloved Vagabond*, 1906; *Septimus*, 1909; *Simon the Jester*, 1910; *The Joyous Adventures of Aristide Pujol*, 1912; *Stella Maris*, 1913; *Jaffery*, 1915; *The Rough Road*, 1918; *The House of Baltazar*, 1920; *Moordius and Co.*, 1923; *The Coming of Amos*, 1924; *The Kingdom of Theophilus*, 1927. Several of these were adapted for the stage and screen. Locke died in Paris, May 15, 1930.

Lockerbie. Burgh and market town of Dumfriesshire, Scotland. It is 12 m. by rly. N.E. of Dumfries.



Lockerbie arms

There is a town hall, and an old border tower adjoins the police station. The lamb fair, called Lockerbie Tryst, held every Aug., was at one time the most important in Scotland. Cattle and sheep markets are held. Market day, Thurs. Pop. 2,800.

Locker-Lampson, FREDERICK (1821-95). British writer. Born at Greenwich, May 29, 1821, he began work in 1837 in a city office, and was at the Admiralty from 1842 until compelled to retire through ill-health in 1849. His father's name was Locker; in 1885 he added Lampson from that of his second wife, Hannah, whom he married in 1874. He died at Rowfant, Sussex, May 30, 1895. *London Lyrics*, 1857, and *London Rhymes*, privately printed 1882, show him

to be in the front rank of parodists and writers of *vers de société*. The Rowfant Library, 1886, records his

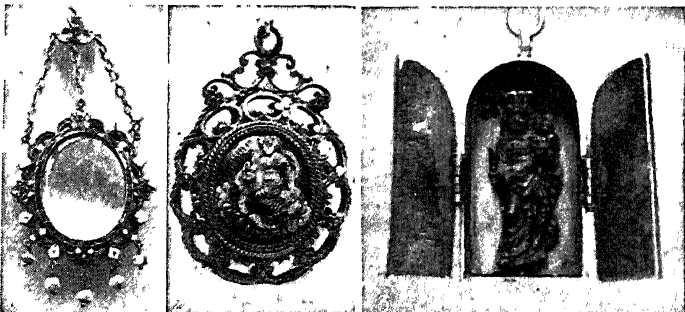


F. Locker-Lampson, British writer

work as a collector of rare books. His son-in-law, Augustine Birrell (*q.v.*), edited his *eminscences*, *My Confidences*, in 1896, and wrote a sketch of his life, 1920. His elder son, Godfrey Lampson Tennyson Locker-Lampson (1875-1946), was born June 19, 1875, and after some years in the diplomatic service was called to the bar in 1906. He sat as Conservative M.P. for Salisbury, 1910-18, thence for Wood Green until 1935. Under-secretary to the Home Office, 1923-25, and under-secretary for foreign affairs, 1925-29, he continued his father's work on the Rowfant Library, inheriting incidentally his facility in light verse. He died May 1, 1946.

A younger son, Oliver Stillingfleet Locker-Lampson (b. 1880), after a brilliant career at Cambridge, became a journalist and conducted the *Empire Review*. He was Conservative M.P. for N. Hunts, 1910; Cambridge Univ., 1918-22; thence for Handsworth until 1945. Commander in the R.N.A.S. in the First Great War, he also served with armoured cars in France, Belgium, Russia, Turkey, and Rumania. He held various parliamentary private secretaryships.

Locket (Fr. *loquet*, latch; cf. lock). Ornamental case hung on a chain round the neck. It is designed to contain a portrait, lock of hair, or other personal souvenir. Lockets appear to have originated with the custom of carrying on the person sacred relics (*q.v.*), the use of which greatly increased with the



Locket. 1. Crystal locket of Italian work, 16th century. 2. Locket or reliquary in silver gilt, with sardonyx cameo of Virgin and Child, Italian, c. 1560. 3. Locket shrine of enamelled gold, containing Virgin and Child in carved wood, French

2 by courtesy of the directors of Victoria and Albert Museum

(Counter-Reformation) They were held to convey mysterious virtue, like amulets. During the Renaissance beautiful lockets, generally of gold, were produced in France, Italy, and Germany. Miniatures surrounded by plaits of hair were common until about 1850.

Lockhart, JOHN GIBSON (1794-1854). Scottish author and editor. Born July 14, 1794, at the manse of Cambusnethan, and educated at Glasgow high school and university, and Balliol College, Oxford, he became a member of the Scottish bar. Articles for Blackwood's Magazine gave full expression to his Tory predilections, and he wrote one or two novels. In 1818 he met Scott, and two years later married his elder daughter, Sophia. In 1825, removing to London, he became editor of The Quarterly Review until 1853. His



After H. W. Pickersgill

latter years were clouded by domestic misfortune, and he died at Abbotsford, Nov. 25, 1854. Lockhart's title to fame is his Life of his father-in-law, 1837-38. He also wrote Burns, 1828, and Napoleon, 1829, and translated Ancient Spanish Ballads, 1823. His son was the Hugh Littlejohn of Scott's Tales of a Grandfather. See Scott, Sir W.

Lockhart, WILLIAM EWART (1846-1900). A Scottish painter. Born at Annan, Feb. 18, 1846, he studied at Edinburgh, and in 1878 became a member of the Royal Scottish Academy. His success as a subject and portrait painter was considerable, and in 1887 he moved to London, having received a royal command to paint the jubilee celebration in Westminster. His subject pictures, many based on travels in Spain, were widely praised. He died Feb. 9, 1900.

Lockheed. American aircraft manufacturers. The Lockheed works at Burbank, Calif., produced large numbers of military aircraft during the Second Great War, notably the Hudson (q.v.), Ventura, and P-38 or Lightning (q.v.). Too late to see active service, the P-80 Shooting Star was the U.S. army's first successful jet fighter, while another outstanding design was the four-engined C-69 or Constellation (q.v.), introduced on many of the world's trunk air routes.

Lock Hospital. Term applied to institutions for the medical treatment of venereal disease. The derivation of the name is uncertain, but it is generally traced to the words of a bequest in 1452, when a London merchant tailor named Holland left 20s. *leprosis de Lokis extra barram Sancti Georgii*, i.e. to the Lock lepers outside St. George's gate, where a hospital for lepers stood. Venereal disease increased about the time that leprosy decreased, and the lazarettos may have been used for the treatment of syphilitic patients.

The London Lock Hospital, originally founded in 1746 at Hyde Park Corner, comprises the institution for female patients in the Harrow Road, to which a rescue home was attached in 1787, and the male hospital and out-patient department in Dean Street, Soho. Bristol, Glasgow, and Manchester have lock hospitals for the exclusive treatment of venereal disease, and similar institutions with the same name exist in various cities in the British dominions.

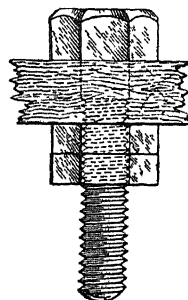
Lockjaw OR TETANUS (Gr. *teinein*, to stretch). An acute infectious disease caused by the *bacillus tetani*. This micro-organism and its spores are widely distributed in the soil of gardens and fields, and may be found in horse manure. Infection may occur through a slight wound, and in civil life the disease occurs most frequently in those who are working with agricultural soil or have had an accident on a road where manure lies. Wounds received in war are very liable to become infected, because the crushed tissues therein allow of conditions suitable to the growth of the bacillus, which flourishes only in the absence of oxygen or of phagocytes.

The toxin of tetanus is one of the most powerful poisons known. Like diphtheria, tetanus produces its results by elaborating a soluble toxin. This is absorbed by the end-plates of motor nerves and runs up these nerves to affect the cells in control. After the bacilli have entered the system there is usually a delay of three days to three weeks before signs develop. The longer the period of incubation, the better the outlook.

Prophylactic treatment is of the utmost importance. Antitoxin is now used extensively; it is a routine method in the treatment of all accidents on agricultural soil or on the highway. In the two Great Wars it helped to bring down to a low percentage cases of

lockjaw among the wounded. It is not advisable to wait for the appearance of the symptoms before using tetanus antitoxin, because the onset of symptoms in tetanus occurs only when the disease is well established.

Lock-nut. Additional nut provided on a bolt. When the main nut is screwed home the lock-nut



Lock-nut screwed on bolt beneath a piece of timber

is screwed down on to it and, by exerting pressure on the screw threads of the bolt in an opposite direction, so tightens the two nuts as to make it almost impossible for them to become loosened by

vibration, or other means against which the lock-nut is intended to guard. To remove a lock-nut, the main nut is held fast by a spanner whilst the lock-nut is unscrewed.

Lock-out. Name given to a forced cessation of work caused by the action of an employer. It is thus the opposite of a strike, in which the workers take the initiative. See Strike.

Lockport. City of New York state, U.S.A., capital of Niagara co. It is on the New York barge canal, 26 m. by rly. N.N.E. of Buffalo. The earlier five locks on the canal have been replaced by two locks operated by electricity. The Odd Fellows Home and Courthouse federal building are the chief edifices. There is an excellent supply of water power and electricity from Niagara and there are quarries of lime and sandstone, a trade in grain and fruit, and manufactures of textiles, steel, etc. The settlement dates from the opening of the Erie Canal in 1825; the city was incorporated in 1865. Pop. 24,379.

Locksley. Assumed name of Robin Hood in Scott's novel Ivanhoe, as in the old ballads. In the novel he is leader of the band of outlaws in Sherwood Forest, wins the archery prize in the tournament at Ashby-de-la-Zouch, helps to rescue the prisoners from Torquilstone Castle, and wins King Richard's favour and pardon by saving his life. See Robin Hood.

Locksley Hall. Dramatic lyric by Tennyson. It is in trochaic heptameters and was published in

1842. Another poem, Locksley Hall Sixty Years After, followed in 1886. In the first the bitterness of thwarted love is relieved by thoughts of human progress; in the second work, hope of universal peace, of curative science, and other marvels of the poet's morning are clouded, but the new lord of Locksley Hall is bidden to:

Follow Light, and do the light—for man
can half-control his doom—
Till you find the deathless Angel seated
in the vacant tomb

Many lines from both poems have passed into common use, notably that of 1842, in which occurs the vision of "the nations' airy navies grappling in the central blue," and "the Parliament of Man, the Federation of the World."

Lockwood, Sir Frank (1846-97). British lawyer and politician, born at Doncaster. From Manchester grammar school he went to Caius College, Cambridge, and in 1872 became a barrister. In 1882 he was made a Q.C., and for fifteen years appeared in almost every leading case in the law courts. As a Liberal politician he entered the house of commons as M.P. for York in 1885. In 1894-95 he was solicitor-general, being then knighted, but on Dec. 18, 1897, he died. Lockwood had an extraordinary gift for caricature, and an exhibition of his work was held; he also inherited a love of horse-racing and a delightful wit. Consult biographical sketch, A. Birrell, 1898.



Sir Frank Lockwood,
British lawyer
Russell

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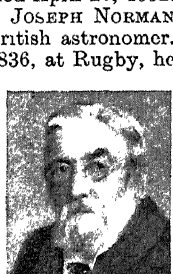
Lockwood, Margaret (b.1916). British film actress. Born at Karachi, India, Sept. 15, 1916, and educated at Sydenham high school, she studied for the stage under Italia Conti, and appeared in A Midsummer Night's Dream at the Holborn Empire, 1928. Work at the R.A.D.A. led to a film engagement in 1934, when she played in Lorna Doone. In The Beloved Vagabond, 1935, Bank Holiday, 1938, and The Lady Vanishes, 1939, she made her reputation as one of Great Britain's leading screen actresses. Later pictures included The Stars Look Down; Quiet Wedding; Dear Octopus; The Man in Grey; A Place of One's Own; The Wicked Lady; Hungry Hill; The White Unicorn; Jassy. She received the Daily Mail award for the most popular British film actress of 1946.

Lockwood, William Henry (1868-1932). English cricketer. Born March 25, 1868, he began his career in first-class cricket with Notts, 1886. In 1889 he transferred to Surrey, for which county he became a brilliant fast bowler and a good batsman. Playing, 1891, against Warwick at the Oval, he captured 4 wickets with successive balls; in 1899 and 1900 he made over 1,000 runs and secured more than 100 wickets; and he played for England against Australia in 1893, 1899, and 1902, taking 11 for 76 in a match at Manchester in the last year. He died April 27, 1932.



W. Lockwood,
English cricketer

Lockyer, Sir Joseph Norman (1836-1920). British astronomer. Born May 17, 1836, at Rugby, he became a clerk at the war office in 1857, and devoted his leisure to astronomy. In 1870 he was secretary to the royal commission on scientific instruction and the advancement of science, and in 1875 was transferred to the science and art



Sir N. Lockyer,
British astronomer
Russell

LOCOMOTIVES: RAILWAY TRACTION

E. C. Poultney, O.B.E., M.Inst.Loco.E.

The origins and development of the railway locomotive from 1803, when Trevithick built the first steam traction engine, to the present day. See also Diesel Engine; Electric Traction; Engine; Gas Turbine; Internal Combustion Engine; Railway; Steam Engine

Locomotives of three types are used on rlys.: (1) self-contained and self-propelled by steam; (2) self-contained and self-propelled by internal combustion; (3) propelled by electric power from an outside source. The steam locomotive is by far the most common. The internal combustion type propelled by oil engines of the Diesel pattern is used in Great Britain for shunting, in the U.S.A. for main line working. Very dense traffic, meaning a high degree of line occupation; heavy traffic to be worked over steeply graded lines; and availability of sources of hydro-electric power are prime reasons that have been instrumental in the introduction of electric traction.

STEAM LOCOMOTIVES. The steam locomotive dates from 1803 when

departed at S. Kensington. Between 1870 and 1905 he led eight eclipse expeditions on behalf of the British government. He became head of the astrophysical observatory at S. Kensington, resigning in 1913 to become director of the Hill Observatory at Salcombe Regis, now known as the Norman Lockyer Observatory (q.v.) Knighted in 1897, Lockyer was president of the British Association in 1903-04, and died at Sidmouth, Aug. 16, 1920.

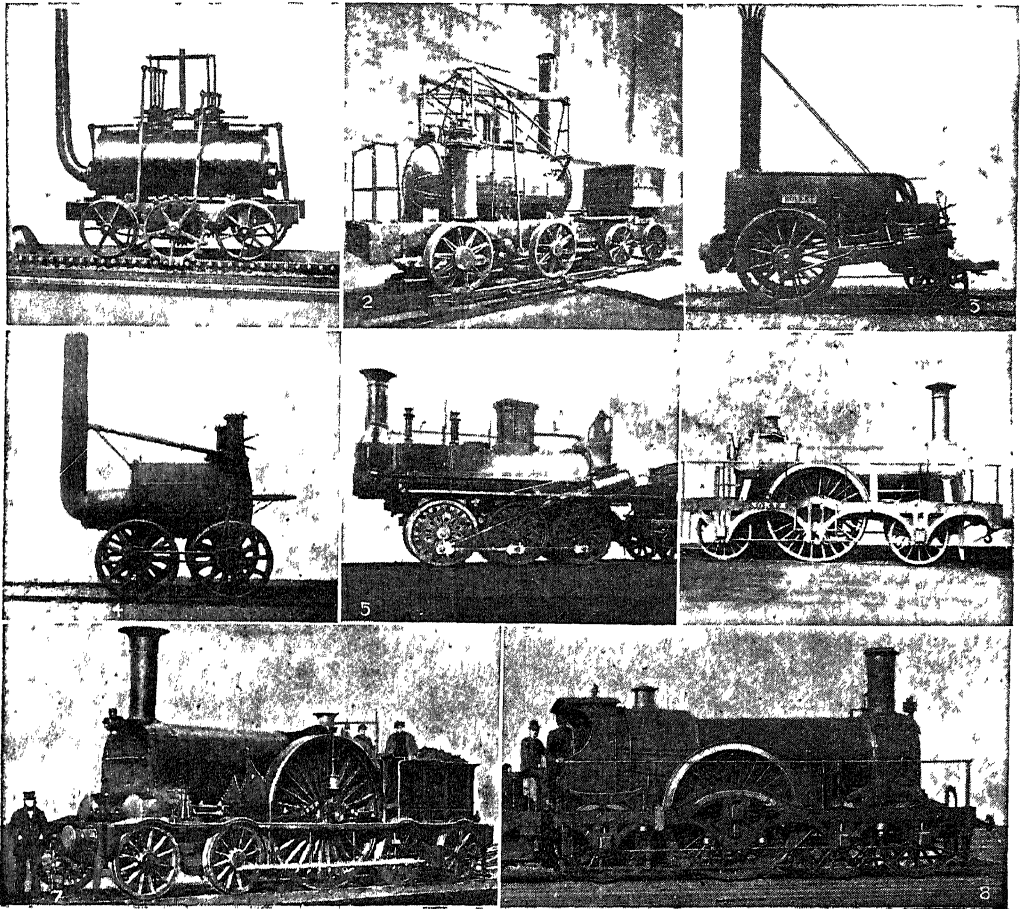
In 1868 Lockyer made the discovery with which his name is always associated, and with that of the French astronomer Janssen—a method of observing the prominences of the sun independently of the occurrence of an eclipse. He also carried out spectroscopic researches into the chemistry of the sun, on which he wrote a book, and explained the spark spectra of the elements as due to successive stages of simplification, a process now known as ionisation. Consult Life and Work, M. and W. Lockyer, 1928.

Locmariaquer. Port of France, in the dept. of Morbihan. It stands on the Morbihan Gulf, Brittany, 15 m. S.W. of Vannes, and is famous for its megalithic stone monuments. The Men-er-Hroek is the tallest French menhir. The chambered tumuli include Man-er-Hroek, 330 ft. long; Man-er-Lud, 264 ft.; and a covered passage, 92 ft., called Pierres-plates. Some include sculptured stones.

Trevithick built the first one. Between this engine and George Stephenson's Rocket, 1829, notable steps in development were Blenkinsop's engine built by Fenton Murray and Wood of Leeds in 1812, Hedley's Puffing Billy of 1813, and Stephenson's Blucher of 1814. Other notable early steam locomotives are Hackworth's Royal George, 1827, the first to have six coupled wheels; another six coupled engine, also by Hackworth, was the Wilberforce, 1831, for the Stockton and Darlington rly.

George Stephenson's Rocket, probably the best known of early locomotives, won the prize of £500 offered in 1829 by the directors of the Manchester and Liverpool rly. Its principal features were:

(1) The multitubular boiler with a firebox rectangular in general



1. Blenkinsop's Leeds locomotive, the first engine commercially used, 1812. 2. Puffing Billy, the first to run on a smooth rail, 1813. 3. The Rocket, built by Stephenson, 1829. 4. Sans Pareil, 1829. 5. Stockton & Darlington Rly. locomotive No. 25, 1845. 6. Stephenson's North Star, 1837. 7. Bristol & Exeter Rly broad gauge engine, 1853-54. 8. G.W. Rly. broad gauge type, 1849.

LOCOMOTIVE: EARLY NINETEENTH CENTURY TYPES OF BRITISH RAILWAY ENGINE

form enclosed within an outer shell united to the horizontal circular or barrel section of the boiler. The inner firebox was thus surrounded by water at the sides, ends, and over the top (but not underneath). At the bottom a fire-grate was arranged to carry the burning fuel. Through the circular section a series of tubes was arranged through which the hot gases from the firebox passed on their way to the chimney.

(2) Two cylinders, one on each side of the engine, drove the leading pair of wheels by means of pistons, piston rods, and connecting rods, the last engaging with crank pins fixed in the wheel centres. The exhaust steam from the cylinders was turned into the base of the chimney, thus inducing a draught through the creation of a partial vacuum in the lower part

of the chimney, which in turn caused a current of air to be drawn through the firebars and firebed.

While the boiler fitted to the Rocket was crude compared with those now constructed, it was so suited to requirements that to this day the same general form of boiler has persisted. Moreover, the necessary draught is still provided by the exhaust steam from the cylinders. The wheels owed their grip on the rails to the weight carried, another feature that continues to characterise steam locomotives, though construction and detail design have greatly increased power output and efficiency.

Some particulars of the Rocket are: cylinders, 8-in. diam.; piston stroke, 17 ins.; driving wheels, 4 ft. 8½ in. diam.; steam pressure, 50 lb. per sq. in. The weight of the engine, excluding the tender, was

4½ tons, 2·61 tons of which rested on the two driving wheels. These dimensions would give the engine a rated tractive force at the point of contact between the wheels and the rail of about 665 lb. The Blenkinsop locomotive of 1812 was fitted with a driving wheel having a number of teeth on the circumference which engaged with a rack rail of cast iron, 3 ft. long, with six cogs in each length, on one side only of the track, the other rail being plain. The engine moved over the rails through the meshing of the cogs of driving wheel and rack rail, not through the frictional resistance between wheel and rail due to pressure of the weight borne by the wheels on the smooth surface of the rail.

At that time the possibilities offered by simple wheel and rail contact were not fully realized.

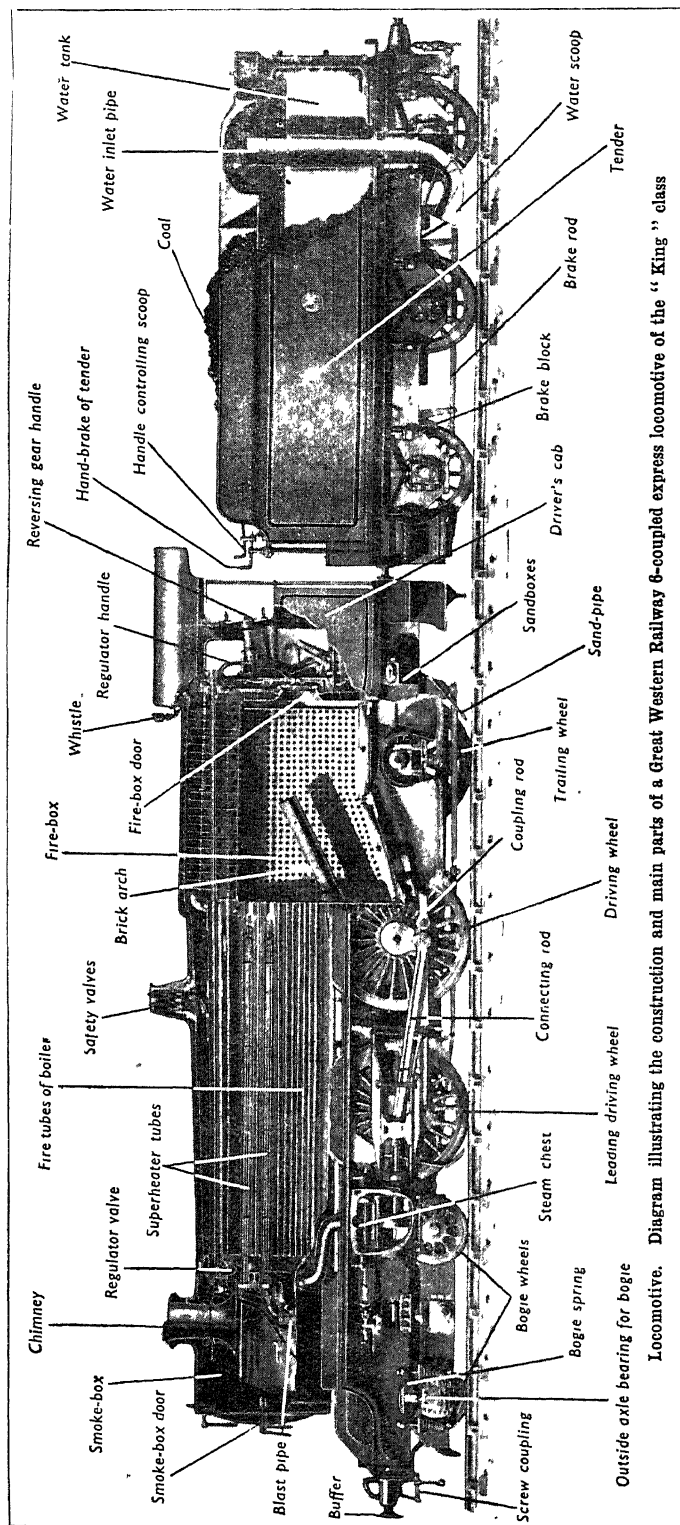


Diagram illustrating the construction and main parts of a Great Western Railway 8-coupled express locomotive of the "King" class

The frictional resistance between wheel and rail is a fundamental characteristic of all forms of rail traction. The coefficient of this friction between a heavily loaded wheel and clean, dry rails is taken as being about 0.30 or $\frac{3}{10}$, meaning that the wheels will not slip if they are pressed on the rails with a force not less than $\frac{3}{33}$ times the force tending to produce rotation. In practice, however, under conditions of maximum tractive force, the force tending to turn the wheels is not uniform throughout the piston's stroke, and the mean rotative force may be increased by 20 p.c. Sanding gear is always provided to assist in preventing wheel slip under adverse conditions.

Wheels : Number and Size

The maximum tractive force that a locomotive can exert is limited by the weight carried by the driving wheels. The number of wheels which must be coupled to the main driving wheels depends on the tractive force exerted by the cylinders and the weight allowed per coupled axle. The Rocket had but one pair of driving wheels because the relatively low tractive force exerted by the cylinders did not demand an adhesive weight greater than that which could be carried by one driving axle. Many locomotives have been built for express passenger traffic having a single pair of driving wheels, but such engines exert insufficient force for contemporary conditions. For freight traffic, engines with six or eight coupled wheels, 54-60 ins. diameter, are usual; for light passenger traffic, engines with a leading four-wheeled bogie and four coupled wheels; for heavy, fast passenger traffic, engines with a leading bogie and six coupled wheels, or, when great power is required, necessitating a larger boiler with more grate area and a larger firebox, a similar type of engine with a further pair of wheels at the hind end under the firebox; wheels for passenger traffic engines are of 75-80 ins. diam. In America the latter type of passenger engine, with wheels of c. 80 ins. diam., has been further developed by adding a four-wheeled bogie or truck under the firebox end of the boiler on account of the large boiler capacity required for the very high powers developed, which may reach 6,000 h.p. produced by the cylinders, and as much as 5,000 h.p. at the rear of the tender. In British practice maxi-

imum power is about 3,000 h.p. at the cylinders.

Where great hauling power is required, as much of the engine weight as possible is carried by the coupled wheels. Such engines may have a pair of leading wheels in a separate frame which swings from a pivot centre by means of a connecting radius arm and makes it possible for them to follow curves in the track. The rest of the engine is then carried by eight, in some instances 10, wheels coupled. The number of wheels that can be coupled depends upon the nature of the line, because extension of the wheel base makes difficulties if there are sharp curves in the track. Five axles coupled (*i.e.* ten wheels) is the maximum under most conditions. In all types the leading pair of coupled wheels is generally allowed a certain amount of lateral movement.

To meet great power requirements and also when the weight carried per axle must be restricted, articulated engines such as the Mallet, the Beyer-Garratt, and, for use in special circumstances, the Shay geared locomotive, have been introduced.

Mallet Engines

Mallet engines of considerable power are to be found on many rlys. in the U.S.A. They have a rear group of coupled wheels complete with a pair of cylinders, one on either side, disposed in a frame supporting the rear end of the engine, and a leading set in a separate frame which is hinged at the back end with the hind framing. This frame supports the front of the boiler through a sliding supporting casting, the upper part of which is attached to the boiler barrel, and the lower part carried by the articulated frame. This support comprises two sliding surfaces taking the weight and incorporates a spring controlled centering device to steady the movement of the leading engine when entering a curve in the track, and to assist in restoring it to a central position when the locomotive is running out of a curve on to a straight road. The steam and exhaust pipe connexions for the front unit are fitted with universal joints on account of its swinging movement relative to the boiler on curves. Such engines may have six or eight coupled power units, while in some instances two ten coupled units have been used. Originally Mallet engines had compound cylinders, but later designs are

generally of the four-cylinder simple expansion type. Large locomotives may have a leading four-wheeled bogie or truck incorporated with the leading unit, and a further four-wheeled truck at the hind end under the firebox.

The Beyer-Garratt articulated locomotive, like the Mallet, comprises two separate power units and one boiler, but has three separate sections made up of a boiler mounted in a framing or cradle under which, near each end, there is the cup portion of a pivot centre. The pivot portions are fixed on the power units, which are alike as regards wheel arrangement, and the pivot centre on each is fixed near the inner end next the boiler section. These two pivot centres are on the longitudinal centre line of the locomotive. Thus, when the centre part is lowered on to the two end or power units, there are three different sections, the end two being able to swing about the pivot centres. Engines of this design thread their way over curves easily, and with a relatively small throw over. Fuel and water are carried by the power units. Articulated locomotives of the Beyer-Garratt type are to be found on many rlys. in S. America, India, Burma, E. Africa, and S. Africa.

The Shay geared locomotive is specially suited to rough light tracks. In place of cylinders driving the coupled wheels direct through the medium of connecting rods in the normal manner, all the wheels of the locomotive are in bogies or trucks of the four-wheeled pattern, and are driven by a three-cylinder inverted engine arranged vertically on one side of the boiler. Locomotives of this kind are in use in the U.S.A. at mines and for lumber. They are not suitable for main line work as are Mallet and Garratt engines.

THE BOILER. This is made up of three parts, the firebox proper, roughly rectangular in shape, enclosed within a shell, and a circular or barrel portion having a horizontal axis. British practice is to use copper plates for the inner firebox, though elsewhere steel is almost universal. The inner and outer fireboxes are stayed together with steel or copper staybolts, generally about $\frac{3}{4}$ in. diam., at the sides and ends. The flat or slightly arched roof of the inner box is supported by direct stays of steel between it and the crown of the firebox shell. The latter is usually semi-circular in form to match the circular barrel, though in the Bel-

paire type the outer crown is flat with flat sides. The inner box is surrounded by water except at the bottom, which is open and contains the grate. The space between the inner and outer firebox at the bottom at grate level is $3\frac{1}{4}$ –4 ins.

Below the grate there is an ashpan, with dampers to control the air supply. The barrel portion is usually made of two or three rings joined telescopically, the smallest in diam. being at the front end; and while the cylindrical form of boiler barrel is the most common, a taper construction is often used. A usual diam. is about 66 ins. inside. Barrel diameters for large express engines built for the L.M.S., which are tapered, are $77\frac{1}{2}$ ins. in diam. next the firebox and 68 $\frac{3}{4}$ ins. at the front end (outside diameters). Large boilers for high powered locomotives may have boiler barrels up to 100 ins. in diam. at the firebox end, and about 90 ins. at the front.

Variations in Boiler Design

Steaming capacity depends upon the size of the firegrate; in British practice this is from 20–50 sq. ft. Boilers of express engines built for the L.M.S. have grates of the latter size. Firing rates vary from 60 to more than 100 lb. of coal per sq. ft. of grate, when engines are being worked to capacity. The number of tubes depends on the size of the boiler, and is related to the grate area, since all gases liberated by the firebox pass through them to the smokebox and chimney. Boiler heating surfaces vary. The express engines built for the L.M.S. rly. have a total evaporative heating surface of 2,807.5 sq. ft. divided as follows: tubes 2,577 sq. ft., firebox 230.5 sq. ft. By way of comparison, and to indicate the size of some of the large boilers used in the U.S.A., engines for heavy express passenger and fast main line freight traffic on the New York Central have a boiler providing 4,832 sq. ft. of evaporative heating surface, tubes 4,115 sq. ft., firebox, with a grate area of 100 sq. ft., 517 sq. ft. These engines have eight coupled wheels and a four-wheeled truck leading and another at the trailing end to support the firebox portion.

THE SMOKEBOX. Beyond the front tube plate there is a chamber called the smokebox. In this are the steam pipes conducting the steam from the boiler to the cylinders, and also the exhaust outlet from the cylinders. This is called the blast pipe. It is placed truly concentric with the chimney, and the exhaust steam issuing from

it diverges outward shaped like an inverted cone, the wide diam. or base of which just strikes the upper part of the slightly tapering chimney, thus acting as a piston. This action, combined with the entraining action of the column of exhaust steam, draws the gases of combustion out of the box and ejects them from the chimney. At the same time, the diminution of pressure in the smokebox sets up an induced draught drawing air through the ashpan, fuel bed, and tubes, upon which the activity of the combustion process depends.

STEAM PRESSURE. Steam pressure is sometimes as high as 300 lb. per sq. in., though usual pressures are from 200–250 lb. per sq. in. The last passenger engines built for the S.R. and G.W.R. carry a working pressure of 280 lb. per sq. in., while the standard pressure on the G.W.R. was 225 lb. per sq. in. for many years.

SUPERHEATERS. One of the greatest advances made in steam locomotive practice since the days of Stephenson's Rocket has been the introduction of the flue tube superheater. Two types of superheater have been applied to locomotives. Both consist of a header fitted in the smokebox receiving steam from the boiler in one section and superheated steam from the superheater elements in another section. From this section the superheated steam is conveyed by steam pipes to the engine cylinders.

One of these superheaters consists of a number of large flue tubes, $5\frac{1}{2}$ to $5\frac{3}{4}$ ins. outside diam., fitted in the upper part of the tube plates. These accommodate the superheater units consisting of four lengths of tubing, $1\frac{1}{2}$ ins. outside diam., joined into a single unit. Each of these units is fitted in one of the large flue tubes, and one end is joined to the saturated steam side of the header, that is, it receives steam as supplied by the boiler, and the other end connects with the superheated steam section. Thus the steam flows through the elements making four passes and in doing so takes up heat from the combustion gases passing through the flue tubes.

The number of sets of elements corresponding to the number of flue tubes depends on the size of the boiler and the amount of steam to be superheated; and the amount by which the steam is superheated above the temperature at which it evaporates depends upon the proportion of the total quantity of flue gases that

passes through the superheater flue tubes and the extent of the superheating surfaces. Usually the number of sets of elements installed is from 18 to 40, though in large boilers of high capacity there may be as many as 65 or 70.

The other superheater, while generally similar to the first, has a large number of smaller flue tubes $3\frac{1}{2}$ –4 ins. diam. Each element, made of $1\frac{1}{4}$ -in. tubing, makes a double pass in one flue and a double pass in another before connecting with the superheated steam side of the header. This type of superheater occupies a greater proportion of the tubular heating surfaces of the boiler and thus imparts a higher degree of superheat for a given combustion rate on the firegrate. The express engine built for the L.M.S. has a 40 element superheater with $5\frac{1}{2}$ -in. flues, giving a superheating surface of 856 sq. ft., while the New York Central engines have small tube superheaters with 177 4-in. flue tubes providing 1,977 sq. ft. of heating surface. The degree of superheat given to the saturated steam is from 200° to 300° F., total steam temperature being normally 600°–650°, and sometimes reaching more than 700° F.

MAIN FRAMES. The main framing for the engine in British practice is of steel plates generally $1\frac{1}{2}$ in. thick and 2–3 ft. wide. They are spaced 4 ft. 1 in. apart and stayed together by stretchers of cast steel or steel plate. The bar frame, originating in Great Britain in a very crude form but no longer used there, holds the field in the U.S.A., where it is composed of side members of cast steel with cast steel cross stretchers or is cast complete in one piece. This steel casting not only comprises the whole of the under framing with such brackets as may be required, but also the cylinders with their hind covers.

The smokebox, usually circular in form corresponding to the diam. of the boiler barrel, is securely fixed to a saddle construction of either cast iron or steel, or of fabricated steel plate, which is attached to the frames at the front end; and at the hind end the firebox, when it fits between the frames, is supported by a long angle-shaped bracket riveted to the sides of the firebox and resting on a similar bracket attached to the top of the frames on either side. This carries the boiler and allows for its expansion. Boilers with large grates have a wide firebox extending transversely over

the frames. Wide firebox boilers are normally used only when small diam. carrying wheels are used at the hind end of the engine. The front buffer beam, carrying the buffers and front draw gear, is usually $1\frac{1}{4}$ in. thick, as is also the buffer beam at the rear of the tender. Tenders have built-up underframes, and the side framing carrying the axle journal bearing boxes and springs is disposed outside the wheels, generally six in number.

CYLINDERS. By far the most usual practice is to use two cylinders taking steam from the superheater. Cylinders used to be placed between the frames under the smokebox, the drive being taken by a cranked axle; later practice is to place them outside the frames, driving direct through crank pins in the wheel centres. Such cylinders have steam distributing piston valves operated by an outside Walschaert valve gear. Inside cylinders normally have flat slide valves between them actuated by Stephenson's curved link double eccentric valve motion; or the valves are arranged above them operated by rockers, though sometimes the valve port faces are inclined relatively to the cylinder axis, the valves being driven direct. In two-cylinder engines, the cranks are always placed at 90° to each other, so as to ensure easy starting. Large British engines have sometimes three, sometimes four cylinders, all receiving steam from the superheater. Three-cylinder engines have two cylinders outside the frames and one between, the three crank pins being at 120° to each other. Four-cylinder designs have two inside and two outside cylinders, the cranks for adjacent cylinders being at 180° to one another, the two pairs at 90°. The three-cylinder type gives a uniform turning moment, and the four-cylinder arrangement a large degree of balance so far as the reciprocating parts of the motion are concerned. The high platforms at British passenger stations set a limit to the size of cylinders.

Since the general introduction of superheated steam, piston valves have become standard. They vary in diam. according to the size of the cylinders, and to the designer's idea of area of steam ports in relation to cylinder dimensions. Four-cylinder engines built for the L.M.S. have four $16\frac{1}{2}$ -in. diam. cylinders fitted with 9-in. valves actuated by two sets of Walschaert valve gear, each work-

ing two valves. New York Central two-cylinder engines have two 25½-in. diam. cylinders with 14-in. piston valves.

COMPOUND ENGINES. During the latter part of the 19th cent. much attention was given to the application of the compound principle to locomotives. In British practice the most notable compounds were those built for the L.N.W. rly. at Crewe between 1880 and 1901. The earlier engines had three cylinders: two high pressure cylinders taking steam from the boiler exhausted into a single low-pressure cylinder placed under the smokebox and between the frames. The H.P. cylinder drove a pair of wheels independently of the pair driven by the single L.P. cylinder. Later engines had four cylinders, two H.P. and two L.P., driving on to one axle, the L.P. cylinders between the frames driving through a crank axle. Another design built for the N.E. rly. had two cylinders only, one H.P. and one L.P. both placed between the frames.

In France four-cylinder compounds were and still are much used. In the U.S.A. there were at one time large numbers of two-cylinder compounds which, owing to a more generous loading gauge, could be built with larger cylinders than those in use in Great Britain. Steam from the boiler must somehow be admitted to the L.P. cylinder or cylinders, to provide adequate starting power. This is especially necessary in two-cylinder compounds. The old L.M.S. line had a number of medium power four-wheel coupled bogie express engines of the three-cylinder compound pattern, but these have one H.P. and two L.P. cylinders, and are superheated.

Compound Principle Obsolete

Since the introduction of superheating, compounding (which, compared with the simple expansion engine, progressed little) is not now practised, except to some extent in France. There are, however, a number of Mallet type articulated locomotives (*v.s.*) to be found in the U.S.A. with compound cylinders.

BOGIES. The four-wheeled bogie consists of a frame structure carrying the spring gear and housing the axle journal bearing boxes. These frames are braced together by a substantial centre casting providing transverse sliding surfaces upon which the main centre casting rests. This casting receives

as a whole can rotate. The transverse casting houses strong coil springs, one on each side of the centre casting, holding the centre pin on the main transverse casting. With this arrangement the bogie can turn about the centre pin carried by a casting fixed to the engine main frames, and can also move laterally relative to the longitudinal centre line of the locomotive, though this movement is resisted by the coil springs. The amount of this resistance should be such that the bogie guides the locomotive into and around curves in the track and at the same time as far as possible protects the leading coupled wheels from flange wear. This type of bogie, the Adams, is virtually standard in British practice. The bogie used on the former G.W.R. and L.M.S. is similar to the Adams, but the weight is not taken at the bogie centre; instead, outside bolsters are used, one on each side, made up of brackets attached to the engine main frames, which transmit the weight to similar brackets on the bogie side frames.

Swinging Links

Another form of four-wheeled bogie has swinging links transferring the engine weight to the bogie through the transverse casting which braces the bogie frames. The links, of which there are four, two on each side of the centre, are in tension. With the bogie in its normal central position, these links are slightly inclined, being wider apart at the bottom where they are pinned to the centre casting. By this arrangement, the weight borne by the bogie resists its transverse movement. Modified swing link bogies have check springs, as in the Adams design. Two-wheeled trucks are arranged to swing from a centre by means of radius arms and have side control coil springs. In the U.S.A. two-wheeled or four-wheeled trailing trucks have a heavy cast steel frame swinging from a centre. The swinging movement of the truck is resisted by two specially shaped members, one at each of the two hind corners of the frame. These take the weight, as they are between the under side of the main framing and the upper surface of the truck frame, on which they make a partial roll when the truck is deflected from its central position as the engine enters or leaves a curve in the track. This rolling movement is resisted by the weight of the engine and, owing to the shape of the rolling members,

assists in centring the truck when the engine re-enters a straight track.

TENDERS. Engines intended for general working on main lines are fitted with tenders carrying supplies of fuel and water amounting to 4–10 tons of coal and 3,000–5,000 gallons of water. In America much larger tenders carry as much as 40 tons of coal and 14,000 gall. of water, or 25–30 tons of coal and 25,000 gall. of water. British main line rlys., excepting what was the Southern, use water pick-up apparatus by which a scoop fitted to the tender can pick up water from long shallow troughs laid between the rails. Usually tenders run on six wheels, though in some instances eight are used in two four-wheeled bogies. The standard six-wheeled tenders used for the largest express engines built for the L.M.S. weigh 54·65 tons when loaded with 10 tons of coal and 4,000 gall. of water.

TANK ENGINES. Some locomotives — tank engines — carry their coal and water supplies on the engine framing, and are thus self-contained units. The tanks are alongside the boiler, one on either side; the coal bunker is at the rear. Such engines may have a leading four-wheeled bogie, another under the bunker, and four coupled or six coupled wheels. For passenger service, six coupled wheels 69 ins. diam. with a two-wheeled truck leading and one with four wheels at the hind end are common. For shunting and light freight trains, six coupled wheels which carry the entire weight of the engine are commonly used.

Supply of Feed Water

Boiler feed water is usually supplied by two injectors operated by steam from the boiler. Another type of injector uses steam from the locomotive cylinders that would otherwise be exhausted up the chimney, and saves heat by returning it to the boiler along with the feed water. British main line engines are nearly always fitted with one live steam and one exhaust steam injector. Other designs of feed water heating equipment are common in Europe and the U.S.A. One uses pumps drawing water from the tender and forcing it through a heater, where it passes through a number of small tubes in a cylindrical container connected by piping to the exhaust pipe in the smokebox. The water thus takes up heat from the steam as it passes through

the tubes and the steam, condensed, is fed into the suction pipe to the pump, and is therefore returned to the boiler with the feed. This is called a closed type heater. Another, with a mixing chamber in which the exhaust steam and the feed water are mixed together, has two pumps, one supplying tender feed water to the mixing chamber and another drawing the hot feed from the heater and forcing it into the boiler. Heaters of this description are known as open type and are analogous to a jet condenser.

In British practice firing is done by hand; but in the U.S.A., where locomotives are of great power, mechanical stokers are almost universal. They are also common in other countries, e.g. in S. Africa. A typical mechanical stoker consists of a screw conveyor arranged in a trough on the longitudinal centre-line of the tender at the bottom of the coal space, and a similar conveyor on the engine sloping upward to the fire door. The two screws are connected by a universal joint, and the one on the engine works in a large diameter pipe. Between these two conveyor sections there is a crusher. The coal on arriving at the fire door is tipped on to a plate just inside the firebox, whence it is blown off by steam jets into the firebox. The conveyor screws are driven by a totally enclosed two-cylinder engine on the tender or on the engine. The steam jets are operated by the fireman, who can so manipulate them that the coal is deposited on any portion of the grate required.

Brake Power

All types of locomotives must have adequate brake power and common practice is to fit a hand brake on the tender, as well as some form of power brake which also acts on the engine. This may be a steam brake or it may be the standard brake used for the train, and this in turn may be the automatic vacuum brake or a compressed air brake such as the Westinghouse. The steam brake when fitted acts automatically with the train brake.

OIL-DRIVEN LOCOMOTIVES. Oil fuel is used in many parts of the world with the normal type of locomotive boiler. The chief changes required include the removal of the firegrate and the lining of the lower part of the firebox with firebricks so that the flame from the burner does not directly impinge on the firebox

plates. The type of burner used delivers the oil and is so constructed that the oil is immediately atomised by a steam jet. Baffles are arranged in the firebox similar to the usual form of brick arch. Air supply is obtained through a damper as used with the normal ashpan. The tender is provided with a fuel tank, and the oil is heated sufficiently to allow it to flow readily through the connecting piping between tender and engine. With fuel oil, it is comparatively easy to obtain complete combustion, and there need be little, if any, smoke. Oil fuel is used in western U.S.A. and in Asia, where oil is readily available.

Oil-Electric Locomotives

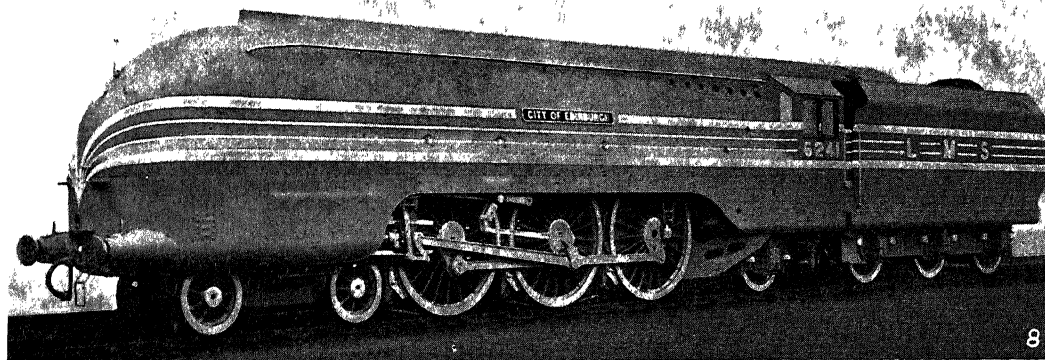
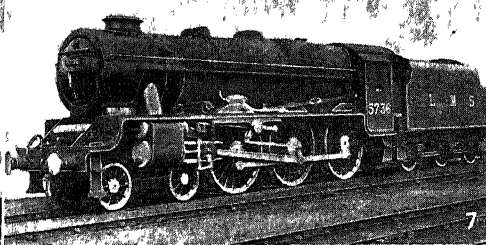
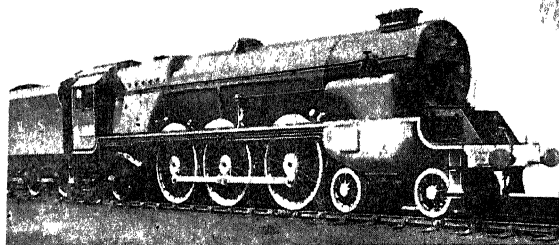
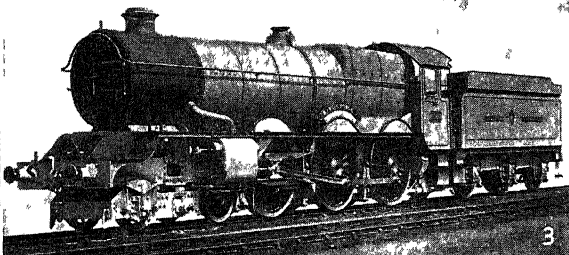
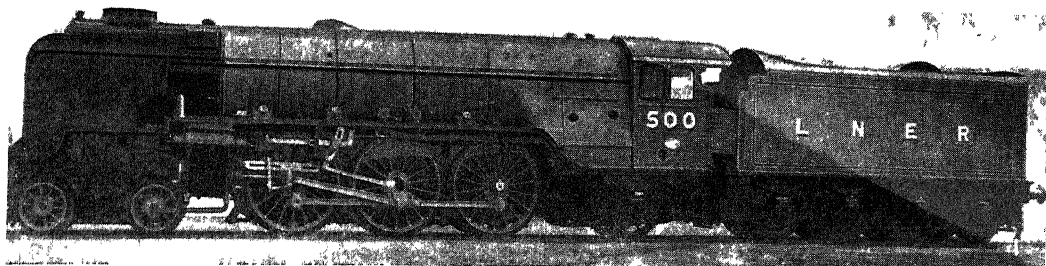
Since about 1920 the oil internal combustion engine has been adopted as motive power for rly. locomotives. At first oil engines were fitted to small locomotives for shunting and other light services, but they were later applied to main line passenger and freight locomotives. Owing to the characteristics of the four-cycle internal combustion engine, some form of intermediate transmission must be disposed between the engine and the locomotive driving wheels, and for small powers mechanical transmissions made up of change-speed gears have been successful, though for larger powers an electric drive is universal. Such a large locomotive has a multi-cylinder compression ignition heavy oil engine directly coupled to an electric generator which supplies current to motors connected by suitable gearing to the driving axles, the number of which depends upon the power of the locomotive. The locomotive is, in effect, a travelling electric power generating unit. A standard oil-electric shunting locomotive introduced by the L.M.S. rly. is six-wheeled, all the wheels being coupled together to provide the required adhesion. It has an underframing with the usual side frames, in this instance disposed outside the wheels, the axles to which are fitted with cranks keyed on for the coupling rods. The cab houses a six-cylinder compression ignition heavy oil engine of 350 b.h.p. with an overload rating of 385 b.h.p. The engine is directly coupled to an electric generator supplying current to two axle-hung traction motors which drive the two outer pairs of wheels through double reduction gearing. The maximum speed is 20 m.p.h.; when pushing trains over the humps very low speeds of from one to three m.p.h. are needed.

When the Diesel locomotive has to be moved from one part of the system to another, it is usually attached to a steam-hauled freight train, which is likely to run at a higher speed than the rated maximum of the Diesel engine; traction motor gears are therefore designed so that the intermediate gears can be thrown out of mesh, thus disengaging the road wheels from the motors.

The driver's cab is at one end of the engine, which contains the control gear governing the speed of the locomotive; the brake handles for the compressed air and hand brakes; and the fan for the radiator cooling the water for the cylinder jackets. The air compressor, the blower for ventilating the traction motors, and the auxiliary exciting generator are all driven by vee belt drives from the main engine. A battery is installed to start the Diesel engine by supplying current to the main generator, which thus acts as a motor and turns the engine crankshaft. The speed of the locomotive is regulated by varying the speed of the Diesel engine through the governor, which is of the oil servo type.

The Driver's Control

The driver's control, of the drum type, is connected to the governor control. The main generator has a self-exciting field and a separately excited field taking its supply from the auxiliary generator. The movement of the driver's control is divided into two phases; in the first the engine speed is held constant at 300 to 330 r.p.m. The strength of the separately excited field current is increased progressively in ten steps, each of which gives the locomotive a different tractive-effort speed characteristic, the maximum starting tractive force in position 10 being 23,000 lb., falling to rather below 4,000 lb. at 4 m.p.h. In the second phase the separate excitation remains at a fixed value and the engine speed is increased uniformly to its maximum of 680 r.p.m. The locomotive can then be operated at any rate of working between 23,000 lb. and 32,000 lb. tractive force at starting and just less than 2,000 lb. at 18 m.p.h. The controller can be moved into a final position which increases the maximum tractive force at 9 m.p.h. to 12,000 lb., compared with c. 8,500 for the second phase position, and produces a tractive force of just under 2,000 lb. at 20 m.p.h. When operating on this notch, if the load exceeds that corresponding to 12,000 lb. tractive force at 8 m.p.h.,

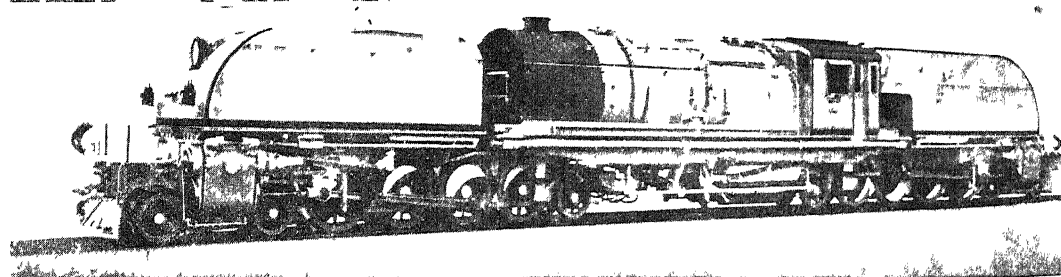
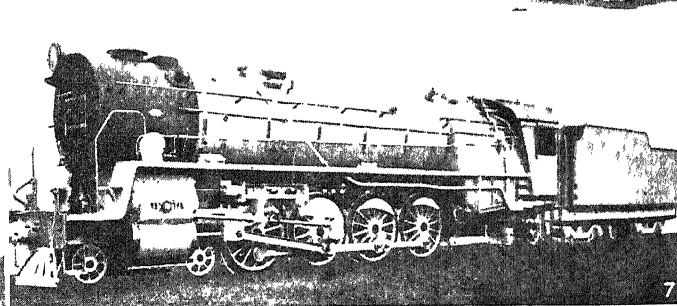
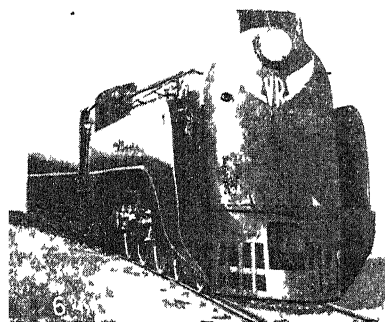
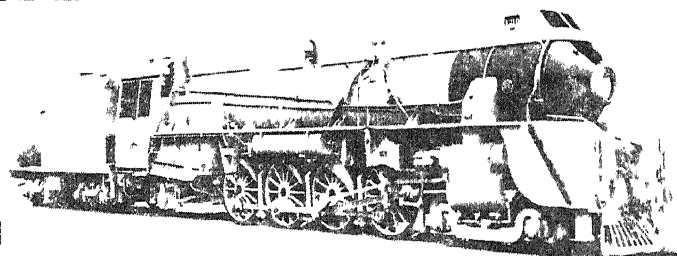
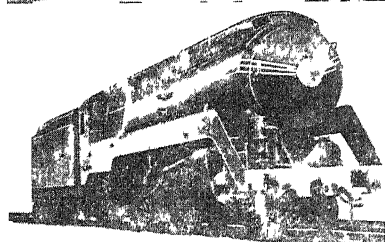
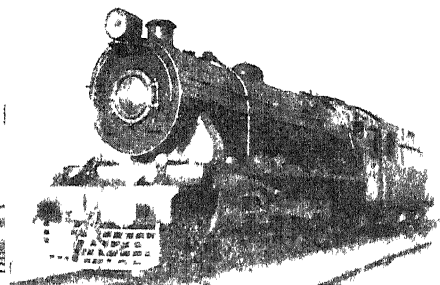
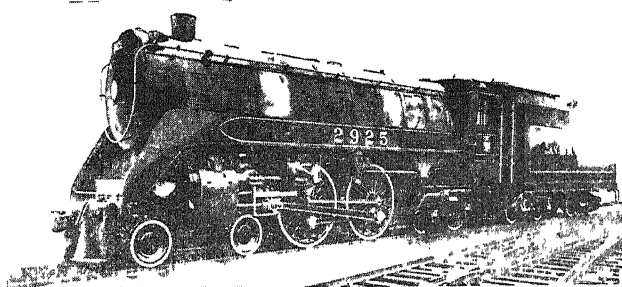
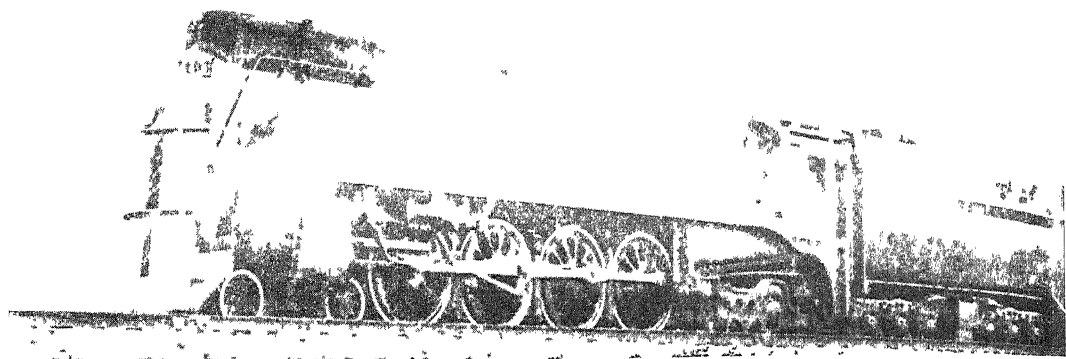


1. Three-cylinder locomotive used on L.N.E.R. expresses, 1946. 2. G.W.R. 4-wheeled shunting locomotive with Diesel engine. 3. G.W.R. 4-cylinder "King" class locomotive for express trains; 1947. 4. Southern Railway air-smoothed "Pacific" type; 1945. 5. Southern Railway

"Schools" class, most powerful 4-coupled engine in Europe. 1930. 6. L.M.S. Railway locomotive. The only turbine-driven locomotive in use in Great Britain; 1935. 7. L.M.S. Railway 3-cylinder "Jubilee" class, 1934. 8. L.M.S. Railway stream-lined "Pacific" type, 1937

LOCOMOTIVE : BRITISH TYPES INTRODUCED IN THE COURSE OF TWO DECADES

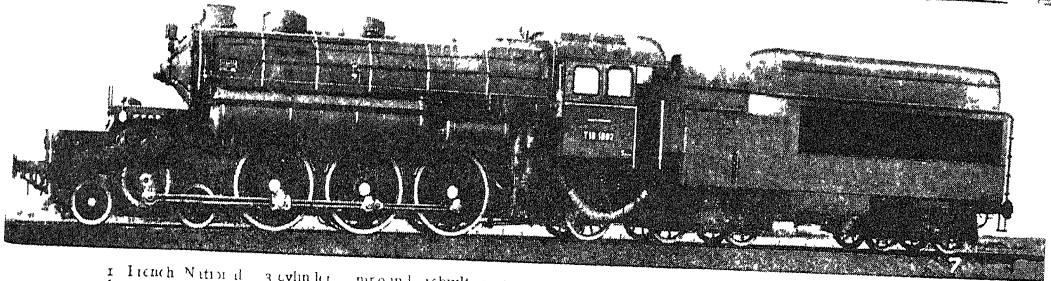
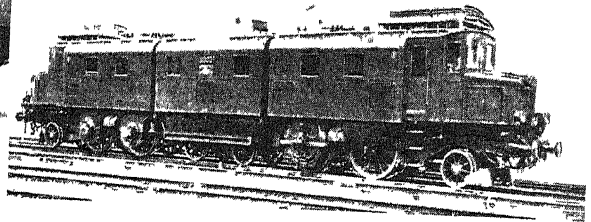
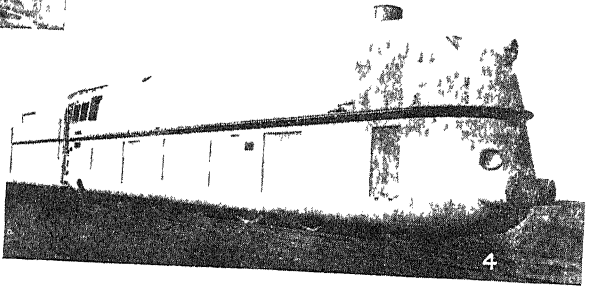
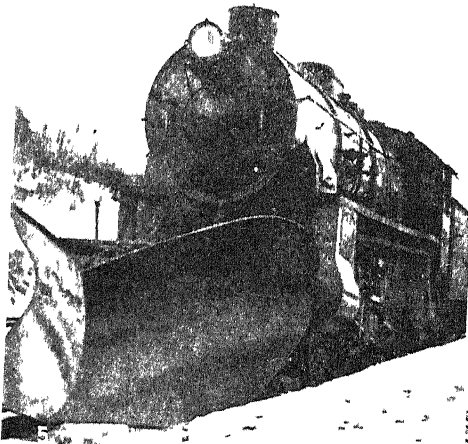
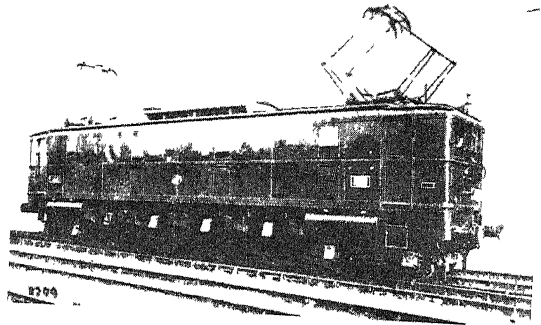
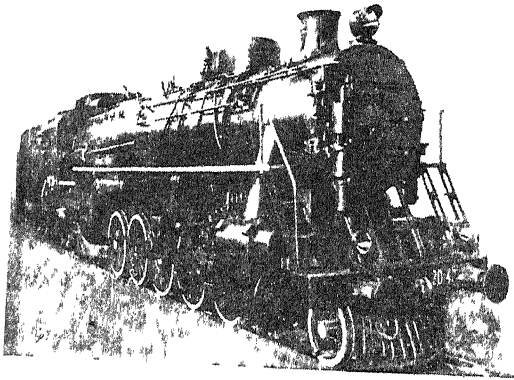
Photos: 1-4, 6 and 7. "The Locomotive"; 5, Southern Railway



1 Canadian National first streamlined locomotive 1936 2 Canadian Pacific for hauling light weight streamlined trains 1936 3 North Western and East India design known as NC 1929 4 New South Wales 2 cylinder C38 Class 1943 5 New Zealand mixed traffic locomotive 1952 6 Viet Nam streamlined locomotive used to haul Spirit of Indochina train 7 South Africa for heavy goods traffic 1952 8 South Africa 3 ft 6 in gauge Porter Garratt locomotive one of the most powerful engines ever constructed for use on 60 lb rail 1940

LOCOMOTIVE ENGINES USED ON THE RAILWAYS OF BRITISH OVERSEAS DOMINIONS

Phot 1 Canadian National Railway 2 5 and 7 11 Locomotive 3 Indian Railway 4 6 and 8 12 Australian

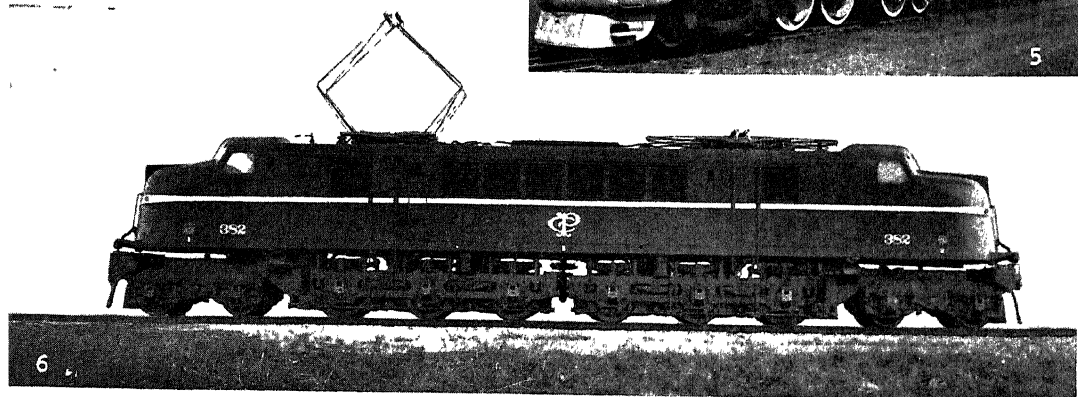
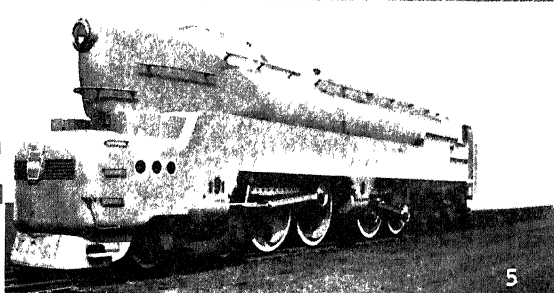
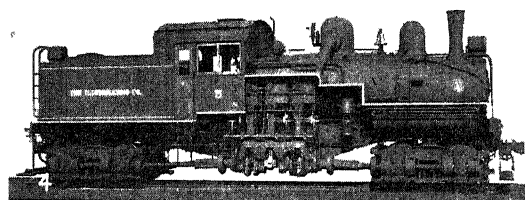
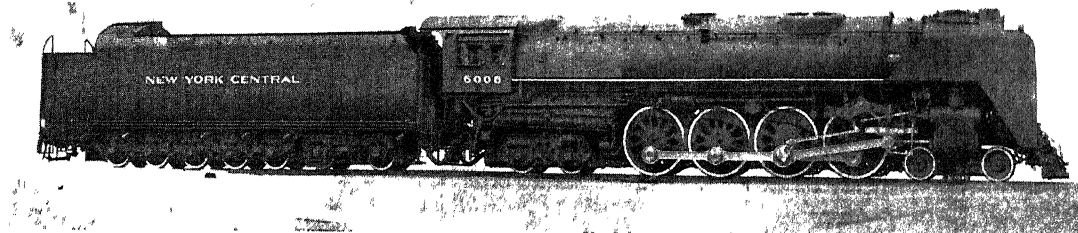
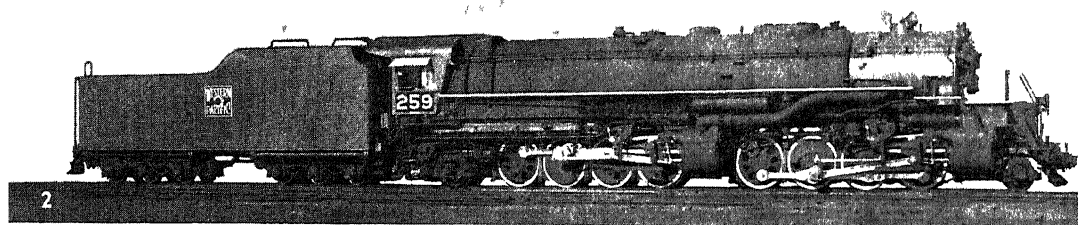
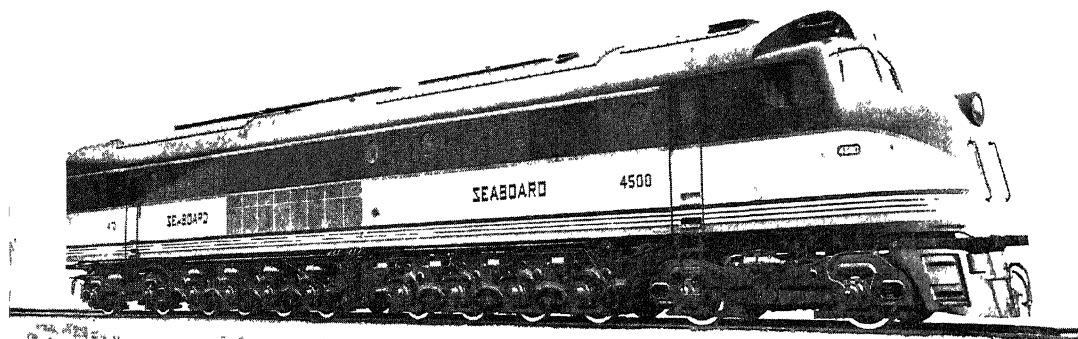


1 French National 3 cylinder model rebuilt 1947
from original built 1903-
5 ft 6 inch gauge is powerful locomotive
3 French National 3 cylinder model built 1903-
Co 1934 German experimental locomotive type

various in form for high speed services 1930s 5 Norwegian State passenger locomotive with snow plough
6 Swiss Federal experimental locomotive with various
forms of transmission 1971 7 German turbine locomotive
engine fitted with undersides tried out in 1930s

LOCOMOTIVE STANDARD AND EXPERIMENTAL ENGINES OF EUROPEAN RAILWAYS

11 for 1 3 4 6 a 17 18 locomotive - 1930s 5 Norwegian official



1. Diesel-electric locomotive built for Seaboard Air Line R.R. Co., U.S.A. 2. Single-expansion articulated locomotive; Western Pacific R.R.; 4 cylinders; tractive effort 137,000 lb. 3. Engine used on New York Central; 1945. 4. Locomotive for logging service in U.S.A.; sole

large-gear type still in production. 5. Pennsylvania R.R.; for high-speed service, giving output comparable with electric locomotive of 4,600 h.p. 6. Electric locomotive; Paulista Railway, Brazil; six wheel axles are driven; weighs 185 tons; runs on 5 ft. 3 in. gauge

LOCOMOTIVE: TYPES USED ON RAILROADS IN NORTH AND SOUTH AMERICA

Photos: 5. "The Locomotive"; 6. For

the engine is overloaded; a device is therefore fitted that will automatically reduce the generator excitation current until the driver brings the control handle back to a lower notch.

High-powered locomotives for main line service on many rlys. in the U.S.A. are often made up of two or three distinct power units coupled together; some develop as much as 6,000 h.p. Such locomotives would have two six-wheeled trucks for each unit, and the outer wheel pairs of each truck would be driven by axle bearing geared traction motors. The Baldwin locomotive works builds an engine of this type made up of three different power units each fitted with two eight-cylinder Diesel engines coupled to generators. The two engines develop 2,000 h.p., and each unit has a maximum tractive force of 76,200 lb. at 30 p.c. adhesion.

Baldwin Locomotive Equipment

Each unit runs on six two-wheeled trucks, the outer wheels of which are driven by axle-hung geared motors. The gear ratio is suitable for a maximum speed of 90 m.p.h. Blowers for cooling the traction motors are belt-driven from the engine crankshaft, and motor-driven fans taking current from the main generators provide air for cooling the engine through shutters in the cab sides, thence through the engine radiators, and discharge it through openings in the roof of the cab. Ventilation for the traction motors is delivered by the blowers by ducts to the truck centres, thence through passages cast in the truck frames to each of the motors. An auxiliary generator exciter set mounted on the frame of the main generator is belt-driven from the main armature shaft. The auxiliary generator charges a battery and the control and lighting circuits; the battery supplies current to the main generator when used as a motor for starting the Diesel engine. Other equipment includes the brake gear with air compressors, a steam generator for heating the train, and the control for the engine and the current supply to the traction motors. Large main-line Diesel electric locomotives are usually arranged in a similar way, though there are differences in detail; in many instances the main engines are fitted with superchargers.

Both electric and Diesel-electric locomotives differ materially from steam locomotives. In the steam engine the power developed in the

cylinders, that is, the indicated h.p., increases as the speed is augmented up to some point in the speed range at which it begins to fall. The exact speed in m.p.h. when maximum power is reached depends upon the steaming power of the boiler and the cylinder design, particularly on the design and size of the steam ports and the valve vents. At full power electric and Diesel electric locomotives deliver a virtually constant power output by the traction motors; therefore such locomotives must have a relatively high maximum starting tractive force compared with a steam locomotive if the tractive force at the rail is to equal that of the steam locomotive at high speeds. The maximum tractive force of electric and Diesel locomotives will be about twice that of a steam locomotive for equal tractive efforts at high speeds, say, from 60 to 80 m.p.h. It is therefore essential that as large a proportion as possible of the weight of electric and Diesel operated locomotives should be available for adhesion. On the other hand the very high tractive force available at the lower ranges of speed gives both electric and Diesel locomotives the advantage of rapid acceleration when drawing heavy trains. The Diesel locomotive, moreover, can traverse great distances without refuelling.

ELECTRIC LOCOMOTIVES. Five different methods of transmitting the drive from the traction motors to the wheels are in general use in electric locomotives. Two called individual drives comprise (1) axle-hung nose-suspended motors with single reduction gears; (2) a gearless type in which the motor armature is keyed on the driven axle. Two other systems, termed collective drives, consist of (1) a single reduction-geared quill drive with one traction motor for the driven axle; (2) a similar arrangement with two traction motors, the driving pinions of which drive one large gear mounted on the hollow quill-shaft in which the main axle revolves. This drives the main wheels by means of a series of spring-cushioned cup assemblies carried on a spider. The spring cups fit in between the wheel spokes, and thus provide a drive which is resilient and also permits the main wheels and their axles to take up any position relative to the engine main frames as they pass over irregularities in the track.

Another drive has a jack-shaft mounted in suitable bearings on

the main frames, and connected by gearing to the traction motor. Outside cranks, one at each outer end of the jack-shaft, drive the main wheels, which are coupled by means of connecting rods. This arrangement, which allows the main wheels and their axles to rise or fall in their axle box guides, has been much used; but some form of hollow axle or quill drive in conjunction with a flexible drive of the same general type is usually considered the most suitable for high powered locomotives. With a quill drive the traction motors are mounted on the main framing of the locomotive and the hollow quill-shaft runs in bearings, also fitted to the frames, so that a gear connexion can be made between the motor pinions and the gears keyed to the quill. The main axle carrying the driving wheels passes through the quill with radial clearance. The spring cup assemblies bear against the sides of the wheel spokes, and the main axle has free movement so that the wheels running on the rails can follow any irregularities in the track.

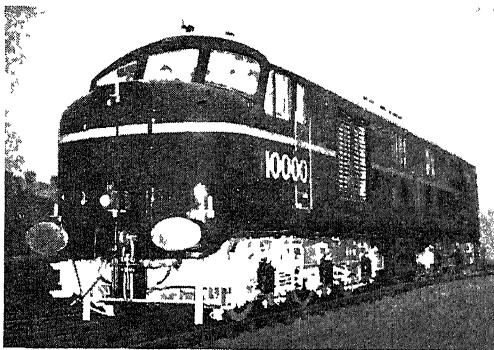
Four Types of Electric Locomotives

Electric locomotives can be divided into four general types: (1) direct current locomotives using the electric current direct through resistance controllers; (2) alternating current (A.C.) locomotives using series A.C. motors, power from the contact system being supplied to a transformer on the engine and the voltage to the motors regulated by connexions to the transformer; (3) motor-generator locomotives taking A.C. current from the contactor system and converting it to D.C. for the D.C. series traction motors by means of a motor generator set on the locomotives; control is by generator field excitation; (4) locomotives with three-phase traction motors taking power from a single-phase contact system through a rotating phase-splitter and a Scott connected transformer.

In general, an electric locomotive is a cab, containing in some designs the traction motors and the whole of the control equipment, with accommodation for the motorman or driver. This is carried on an underframing supported by the main framing with the housings for the axle journal bearing boxes and appropriate suspension springs and connexions. Where a jack-shaft drive is used, the motors are above the frames in the cab. Otherwise the motors are below the cab underframing, the drive

used being of either individual or collective type. The cab contains the locomotive and train-braking system; the cab of a passenger locomotive contains in addition a steam boiler for heating the train. The ventilating equipment controlling the temperature of the traction motors, also in the cab, may consist of blowers directly driven by motors and the air ducts to the motors.

Electric locomotives receive the electric current through a third



Locomotive. First main line Diesel electric locomotive put into service on the L.M.S. line in 1948

rail, from which power is gathered by a shoe travelling along and making contact with the rail; or through overhead wires, contact being maintained through a pantograph on the roof with a spring control device. The characteristics of the electric current supplied vary considerably. The Chicago, Milwaukee, and St. Paul line, uses D.C. current at 3,000 volts. A scheme put into operation in 1915 covers 440 route m. of track from Harlowton, Mont., to Avery, Idaho, between which the line crosses the Rocky Mts. and a further 220 m. to Othello, Tacoma, and Seattle. The Pennsylvania rly. opened an electrified line in 1910 between New York, Washington, D.C., and Harrisburg, Pa., 674 route m. At first only the line running in the tunnels under the Hudson to the new passenger terminal was electrified; it used current at 650 volts D.C. and the third rail. That system has been replaced over a large part of the line by the overhead system with an 11,000 volt A.C. supply at 25 cycles.

The electrification of the railway line between Manchester and Sheffield involves the use of D.C. current at 1,500 volts. The electric locomotives run on two four-wheeled bogies articulated together by a hinge connexion, each having two motors developing 1,860 h.p. one hour rating, and 1,360 h.p. continuously. The tractive force, maximum, is about 45,000 lb. These locomotives weigh 88 tons; as the whole of this weight is available for adhesion, the factor of adhesion at maximum tractive force is 4.38. These locomotives are intended for both passenger and freight

trains, and are suitable for speeds up to 65 m.p.h. The traction motors have forced ventilation and are insulated for 1,500 volts, though they are permanently connected in two pairs with 750 volts across the brushes of each motor. The motors are operated in series and parallel combinations, and there are four stages of field weakening.

The traction motors of an electric locomotive can be used as a generator on descending grades.

This returns the current generated to the power lines, and assists greatly in controlling the speed of heavy trains on steep down grades. The locomotives built for the L.N.E.R. are fitted for this system of working.

Electric locomotives can be built to develop virtually unlimited power compared with either a steam or an oil-driven locomotive, because the power is taken from exterior generating plants which can be of any desired capacity. Electric locomotives for passenger service usually consist of a single unit, but they can be made up of two or three units coupled together for handling very heavy freight trains over steep grades; this is done on the Virginian line for heavy coal traffic, where the locomotives have three units, each with two sets of four coupled wheels, and each having a jack-shaft drive. This is a 570-ton, 11,000-volt, single phase locomotive of 6,090 h.p. one hour rating at 14.1 m.p.h. The continuous tractive force is 135,000 lb. at 14.2 m.p.h., and 78,750 lb. at 28.4 m.p.h. The high speed passenger locomotives used by the Pennsylvania rly. receive 11,000 volt A.C. current and have a rated continuous h.p. of 4,620, a maximum tractive force of 72,800 lb., and a top speed of 90 m.p.h. These locomotives run on

two articulated cast steel frames, each with three driving axles with 57-in. wheels. At the outer end of each of these articulated frames there is a four-wheeled bogie or truck so that the locomotive runs on 20 wheels, 12 of which receive power from the traction motors, each pair driving through a quill form of drive and spring cup assemblies. The total weight is 205 tons, of which 134 tons or 65 p.c. rests on the driving wheels; the factor of adhesion is therefore 4.1. They use the overhead system.

Locomotor Ataxia (Gr. *ataxia*, disorder) OR **TABES DORSALIS** (Lat. *tubus*, wasting; *dorsum*, back). A syphilitic infection of the nervous system characterised by incoordination, sensory disturbances, and involvement of the special senses, especially the eyes. Changes and degeneration are found in the posterior nerve roots and also in the dorsal part of the spinal cord which is wasted and flattened. It is more common in men than in women, and is more rarely seen in negroes than whites. Frequently observed between the thirtieth and fortieth year, it may sometimes be delayed as long as 30 years after infection with syphilis, which event may have passed unnoticed by the patient. About five p.c. of untreated syphilites develop this complication. Juvenile forms may result from congenital infection.

The onset is gradual, the earliest symptom being that of lightning pains which may be mistaken for rheumatism. These are like electric shocks, or stabbing or burning in character, usually occurring in paroxysms transversely through the legs. A few cases have attacks of acute abdominal pain (gastric crises) and others a progressive failure of vision and blindness (optic atrophy). As the disease progresses, the patient becomes unsteady on his feet, more noticeably so in the dark. There is no true paralysis but rather a failure to place the feet where required with precision, and the characteristic gait has a wide base as the patient jerks the legs outwards before bringing down the feet with a stamp. Sometimes the arms are affected and the patient is unable accurately to gauge his movements especially when his eyes are closed. At first the disability is met by a more attentive use of the eyes but, as time goes on, walking becomes impossible first without the aid of two sticks and finally altogether, and the patient be-

comes bedridden and dies of an intercurrent disease such as pneumonia or tuberculosis.

Two important diagnostic signs are (1) loss of the knee jerks: *i.e.* when one knee is crossed over the other and the patella tendon just below the knee cap is smartly tapped, the leg fails to give the kick noted in normal people; the ankle jerks are likewise often lost; (2) failure of the pupil to contract when a bright light is cast across the eye. The same pupil may, however, still react when focusing on a near object (Argyll-Robertson pupil), though loss of both mechanisms is not infrequent.

The pupils also often become very small, unequal, or irregular. A drooping of the eyelids is compensated by a wrinkling of the forehead. Painless, persistent ulceration of the sole of the foot (perforating ulcer) and a painless and extensive disorganization of a large joint (Charcot's joint) also occur, as do difficulty and incontinence of urination and defecation. The blood tests for syphilis are positive in 50-70 p.c. of cases, although patients with negative reactions often show abnormalities in the cerebrospinal fluid.

Damaged nerve tracts can never be repaired, and the aim of treatment is to arrest progression and hope for an improvement of function by the use of remedial exercises. Penicillin, organic arsenical compounds, bismuth, and fever treatment with induced malaria are all used to this end. Spontaneous arrest may occur without treatment, as may progression in a treated case in the face of persistently negative tests. The disease may be foretold, and by judicious action prevented, years before the onset of clinical symptoms or signs, by the discovery of abnormalities in the cerebrospinal fluid. The desirability is therefore stressed of the performance of routine lumbar puncture (spinal tap) tests on all cases of early syphilis before they are discharged as cured.

R. R. Willcox

Locris. Name of three districts of ancient Greece, inhabited by the Locri or Locrians. (1) Epine-midia, a littoral on the Italian gulf, N. of Phocis, which takes its name from Mt. Cnemis. (2) Opuntia, so called from its chief town Opus, a littoral opposite Euboea. (3) Ozolis, bounded N. by Doris, E. by Phocis, S. by the Gulf of Corinth. The name (Gr. *ozein*, to smell) refers to its strong-smelling sulphur springs or the

goat-skins worn by the inhabitants. (1) and (2) were separated from each other by a narrow strip of Phocian territory, and both from (3) by the whole of Phocis.

Locri Epizephyrii, or the western Locrians, a colony of one of the above, was situated on the coast in the S.E. of Bruttii in Italy. It was the birthplace of Zaleucus (7th cent. B.C.), who drew up the first written code of laws in Greece.

Locus (Lat., place). A word occurring in several phrases used in English law. *Locus contractus*, the place of contract, is important in international commerce, the rule, in general, being that the validity of a contract is decided by the law of the place where it is made. *Locus in quo* describes the place in which matters involved in the action took place, or about which controversy exists. Thus, the spot where an accident happened would be the *locus in quo* in an action or prosecution arising out of the accident. *Locus poenitentiae* (place of repentance) is the term for the right to withdraw from a contract before it has been legally confirmed. *Locus sigilli* (place of the seal), written, abbreviated as L.S., beside a circle, indicates the place where the seal must be attached to a document. *Locus standi* (standing ground) describes the right of a person to appear in legal proceedings and be heard by the court. In private bill legislation before committees of either house of parliament, anyone wishing to be heard in opposition must present a petition to establish his *locus standi*, *i.e.* he must show that some private or pecuniary interest of his would be affected by the bill.

Locus (Lat., place). Term in mathematics to denote (a) the line or surface traced out by a point or a line which moves according to given conditions; or (b) the line or surface containing all points satisfying certain conditions. The locus of a point moving in all directions at a constant distance from a given fixed point is the surface of a sphere whose centre is the given fixed point and whose radius is the constant distance. That of a point which moves in a plane at a constant distance from a given fixed point is the circumference of a circle. Conversely, the line bisecting an angle is the locus of all points equidistant from the arms of the angle. An ellipse is the locus of a point which moves in a plane so that the sum of its distances from two fixed points in the plane is constant.

Locus is also the cytological term for the position of a gene (*q.v.*) in a chromosome.



Locust. Specimen of the desert locust (half actual size)

Locust. Name given to those species of short-horned grasshoppers (family Acrididae) which at times become predominantly gregarious and often migrate long distances in large swarms. Recent discoveries by Uvarov, Faure, and others have shown that locusts occur in two different phases, previously regarded as separate species. These are (1) a highly destructive gregarious or swarming phase, and (2) a more or less innocuous solitary phase. Development into the gregarious phase occurs where climate and vegetation favours mass increase of the insects, such tracts being known as outbreak areas. Elsewhere, locusts occur in the solitary phase and do not differ from ordinary short-horned grasshoppers. While the main differences between the two phases are biological, variations in form and colour are evident. In the gregarious phase locust swarms do much damage, but the greatest injuries are caused by the young offspring or hoppers which advance in great bands devouring all before them.

The chief locusts of the Old World include the migratory locust (*Locusta migratoria*), abundant over much of Africa and Asia and also found in S.E. Europe. Its outbreak areas are the great reed beds of the deltas of the Danube, Volga, Niger, and of the Caspian and Aral Seas. The desert locust (*Schistocerca gregaria*) develops into migratory swarms along the Red Sea. The ideal method of control is so to alter by cultivation the outbreak areas that they no longer provide the conditions for swarm development. Dusting with toxic compounds by aeroplane aims at destroying swarms before they embark on migratory flights. Deep trenches in the paths of the hoppers, and the dissemination of poisonous ground bait, are often resorted to. An international locust bureau is at work in London.

Locust Bean. Pod of the carob tree (*Ceratonia siliqua*), a native of the countries bordering

the E. Mediterranean. Ground into meal, the pods form an appetising sugar food, especially valued for stimulating the flagging appetites of fattening stock in the later stages. From it is also extracted the mucilage known as gum tragasol, the best-known size for yarns. It is used for finishing silk, cotton, and linen fabrics, and also for toilet soaps and confectionery. *See* Carob.

Loddon. River in the S. of England. It rises near Old Basingstoke, Hampshire, and flows 31 m. N.E. through S.E. Berkshire to the Thames at Wargrave.

Lode. In geology, term denoting a fracture zone filled with minerals and partially replaced country-rock, constituting an ore-body. The fracture zone consists of approximately parallel fissures, closely spaced over a considerable width, sometimes 100 ft. or more. The ore filling these fissures and partially replacing the country-rock along the walls will be a mixture of valuable ore-minerals and worthless gangue minerals. *See* Gangue; Ore.

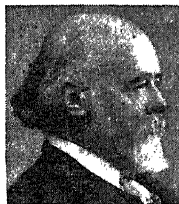
Lodestar. A star which serves to lead or guide. The name is more specifically given to the pole star, in allusion to the fact that a lodestone (*v.i.*) points north.

Lodestone. Mineral consisting of a mixture of the two oxides of iron, FeO and Fe_2O_3 . It has a specific gravity of 5, and is a hard, opaque mineral with metallic structure. Widely distributed, it enters into the composition of many volcanic rocks, and its deposits serve as important sources of iron. The largest workable deposits are at Kirunavaara and Gellivare in Sweden. Sometimes called magnetite, lodestone, or a piece of iron which has been rubbed with it, will direct itself to point north. This magnetic property caused it to be used by ancient navigators as a sort of compass. The term lodestone is also a synonym for the philosopher's stone which, according to the alchemists, could transmute base metals into gold. *See* Iron.

Lodge, HENRY CABOT (1850-1924). An American statesman. Born at Boston, May 12, 1850, he was educated at Harvard. He became a barrister in 1876, having been assistant editor of *The North American Review*. In 1880 he was sent to the house of representatives of Massachusetts, and in 1886 was elected to congress. Seven years later he became a senator, and was re-elected for each term up to 1923. A leading Republican,

Lodge was a delegate at several party conventions. In 1903 he was on the Alaskan boundary commission. As an historian, Lodge lectured at Harvard; he wrote *Lives of Washington, Hamilton, and Webster; History of Boston, 1891; The War with Spain, 1899; One Hundred Years of Peace, 1913; The Senate and the League of Nations, 1925*. He published volumes of his speeches, and edited *The Life and Letters of George Cabot, and Hamilton's Works*. He spoke vigorously in favour of the participation of America in the First Great War, and as Republican leader in the senate put down "Lodge reservations" to the Versailles treaty which Wilson refused to accept and which prevented ratification of the treaty by the U.S.A. He died Nov. 9, 1924. His son George (1873-1909) was a poet.

Lodge, SIR OLIVER JOSEPH (1851-1940). British scientist. Born at Penkhull, Staffs, June 12, 1851, he was educated at Newport grammar school, which he left at 14 to enter his father's pottery business. But his interests were scientific, and he became an external student at London university, then in 1874 a full-time one at University College, where he took his



Sir Oliver Lodge,
British scientist

doctorate of science in 1877. Assistant professor of applied mathematics two years later, he also lectured at Bedford College. In 1881 he was elected first professor of physics at Liverpool; and from 1900 was principal of the new university of Birmingham until 1919, when he retired to his country house at Normanton, near Salisbury. He died Aug. 22, 1940.

Lodge's reputation as a scientist rests chiefly on his researches into radiation and the relation between matter and ether. His writings giving the results showed mathematical acumen, resource in devising apparatus, and a gift for putting into practice theories evolved in the laboratory. In 1899 he was awarded the Rumford



Henry C. Lodge,
American statesman

medal for experiments in lightning conductors, Hertz later admitting that Lodge almost achieved the discovery of electro-magnetic radiation. He invented a coherer, and, using it as a detector, was the first to accomplish radio telegraphy. A pioneer in the theory of electrolysis and in the study of the movements of ions, Lodge contributed much to the practical application of physical knowledge. He improved sparking plugs and worked out an electrical method of fog dispersal. Meeting the American medium Mrs. Piper, he became interested in spiritualism, of which later he was a leading exponent. His book *Raymond, or Life and Death*, is an account of supposed conversations between himself and the spirit of his son killed in the First Great War.

Knighted in 1902, and F.R.S. from 1887 he was Romanes lecturer at Oxford, 1903, president of the Physical Society, 1899-1900, of the Society for Psychical Research, 1901-04, and of the British Association, 1913. In 1932 he was awarded the Faraday medal by the Institution of Electrical Engineers. Among his publications were *Modern Views of Electricity*, 1889, rev. ed. 1907; *Life and Matter*, 1905; *Man and the Universe*, 1908; *Modern Problems*, 1912; *Ether and Reality*, 1925; *Relativity*, 1925; *Science and Human Progress*, 1927; and several books on spiritualism. He published an autobiography, *Last Years*, rev. ed. 1934.

Lodge, THOMAS (c. 1558-1625). English dramatist. The second son of Sir Thomas Lodge (d. 1584), lord mayor of London, he passed from Merchant Taylors' School to Trinity College, Oxford, and, as a student at Lincoln's Inn, associated with Robert Greene. In 1580 he wrote a *Defence of Stage Plays, Poetry, and Music*. He sailed with expeditions to the Canaries and S. America, during the first of which he composed *Rosalynde*, a cuphuistic romance, founded on the 14th century tale of Gamelyn, from which Shakespeare drew the plot of *As You Like It*. Lodge wrote the play, *The Wounds of Civil War*, dealing with Marius and Sulla, collaborated with Greene in *The Looking-Glass for London and England*, in which the Biblical story of Nineveh is applied to the English capital, published translations of Josephus and Seneca, and composed a satire entitled *A Fig for Momus*, directed against critics. He took a medical

degree at Avignon in 1600, and wrote a treatise on the plague, of which he himself died in London.

Lodger. Word having no precise legal meaning, most often applied to a person who lives in the house of another. He is distinguished from a tenant in that, although he may occupy a room, the general control of the house including the room remains with the householder. The word is also applied to a person who has exclusive control over the room he occupies and is therefore a tenant.

The Law of Distress Amendment Act, 1908, protected lodgers' goods from being seized by distress for rent due by the householder to his landlord. The Representation of the People Acts, 1867 and 1884, gave the vote to lodgers if they occupied separately lodgings of the annual value of £10. This franchise has now been replaced by universal suffrage. A mere lodger—i.e. one who is not a tenant with full legal control over a room—is not entitled to the protection of the Rent Restriction Acts. The householder is bound to take reasonable care of the property of his lodger. Magistrates have power under the Metropolitan Police Courts Act, 1839, to order any lodger who has done wilful damage to pay compensation up to £15. See Rent Tribunal.

Lodging House. Building in the U.K. intended to furnish shelter to homeless persons, in most houses restricted to men. The charge is usually a few pence per night. A general feature of these shelters is the common kitchen, where lodgers may cook and eat their food. The beds are often ranged in large dormitories; though the better-class lodging-house sometimes offers small cubicles, each containing a bunk.

Common lodging-houses are controlled by the Public Health Act, 1936, which provides for their registration and inspection, and enacts that they may be kept only by registered keepers. The police may prosecute any lodging-house keeper who knowingly harbours thieves. Certain progressive municipalities and private societies have provided well-planned and comfortable lodging-houses at a cost to the inmates no greater than that charged for the foul dens that Dickens has so vividly described. The Rowton Houses (*q.v.*) in London are models of philanthropy in this direction, although they return a moderate dividend to shareholders. Cecil Houses for women, the first of which was

opened in 1927, were founded as a memorial to Cecil Chesterton; the h.q. is 193, Gower Street, London, W.C.1.

Lodi. City of Italy, in the prov. of Milan. It stands on the river Adda, 20 m. by rly. S.E. of Milan. Its fine cathedral dates from the 12th century. A large trade is carried on in Parmesan and Stracchino cheese, and wine, while the manufactures include majolica, silk, and linen. Lodi was founded by Frederick Barbarossa in 1162, after the destruction of Lodi Vecchio, near the site of Laus Pompeia, a Roman colony, destroyed by Milan in 1111 and 1158.

Lodi, BATTLE OF. Victory of Napoleon over the Austrians, on May 10, 1796. Pursuing his plan

for driving the Austrians from Italy and seizing Milan, Napoleon followed the Austrians from Piacenza, and, occupying the town of Lodi, made ready to cross the Adda. The bridge there was strongly held by the enemy, and though the French cavalry forded the river higher up, the main attack was made on the bridge, the French troops led by Masséna dashing across amid a torrent of shot and shell. The Austrians were routed, and Napoleon marched to Milan without further opposition. It was at Lodi that Napoleon was first called *Le Petit Caporal*.

Lodore. Locality in Cumberland, England. At the S. extremity of Derwentwater, it lies 3 m. S. of Keswick. The waterfalls of Lodore are perhaps less remarkable as a spectacle than for having inspired a poem in which Southey achieved a *tour de force* in rhyming.

Lody, CARL (d. 1914). German spy. A lieutenant in the German naval reserve, who had served on the Kaiser's yacht, Lody was selected for the work of espionage in Great Britain after the outbreak of the First Great War, and was provided with a passport, stolen by the German foreign office. He went to London and to the naval dockyard at Rosyth, where he complained to the police of being shadowed, and was allowed to go. He was responsible for the sinking of the British cruiser Pathfinder by forwarding a telegram. From London he moved to Liverpool and Killarney, where he was arrested.

and on him was found ample evidence of guilt. Lody was shot in the Tower of London on Nov. 6, 1914, the first German spy executed in Great Britain during the war.

Lodz. Second city of Poland. It is 30 m. N.W. of Piotrkow, 75 m. S.W. of Warsaw, on the Lodka, and is connected by a branch line with the Warsaw-Vienna rly. It is the headquarters of the textile industries of Poland, and one of the principal centres of the world for the manufacture of cotton goods. Other industries are brewing, distilling, the making of bricks, steam-boilers, and machinery. The town, which consists of one main street 5 m. long, was only a poor village in 1821. The first cotton mill was set up in 1835, and its



Lodz, Poland. General view of the city, one of the world's greatest centres of the cotton industry

prosperity afterwards steadily increased. Pop. 496,861. Lodz gives its name to a county.

The German armies won a success over the Russians at Lodz early in the First Great War. Concentrated attacks were delivered on Nov. 27–28, 1914, from N., W., and S., but were repulsed with heavy losses. Five days later they attacked again from the N., but were driven off in hand-to-hand fighting. The town, however, formed an awkward salient in the Russian line, and they abandoned it without loss on the night of Dec. 5. Heavily attacked from the air on Sept. 1, 1939, the first day of the German invasion of Poland, Lodz was evacuated by the Poles on Sept. 8. When Germany and Russia partitioned the country on Sept. 28, Lodz was in the German-occupied section of Poland. The city was captured by the Russians under Marshal Zhukov, Jan. 19, 1945.

Loeb, JACQUES (1859–1924). American physiologist. Born in Germany, April 9, 1859, he studied medicine at several universities, and in 1891 settled in the U.S.A. After holding professorships at Bryn Mawr College, Pa., and Chicago and California univer-

sities, in 1910 he became head of the department of experimental biology at the Rockefeller Institute, N.Y. His chief works include Heliotropism of Animals, 1890; Physiological Morphology, 1891-92; Comparative Physiology of the Brain and Comparative Psychology, 1900; Dynamics of Living Matter, 1906; Artificial Parthenogenesis and Fertilisation, 1913; Forced Movements, Tropisms, and Animal Conduct, 1918. He died Feb. 12, 1924.

Loeb, JAMES (1867-1933). An American banker. Born Aug. 6, 1867, he was educated at Harvard university, and joined the banking firm of Kuhn, Loeb & Co., retiring in 1901. He founded and endowed the Institute of Musical Art, N.Y.C., and the Loeb classical library, which published editions, with text and translation on opposite pages, of all Greek authors from Homer down to the fall of Constantinople in 1453, and all Latin authors down to the time of Charlemagne, 800. Loeb died May 29, 1933.

Loeffler, FRIEDRICH (1852-1915). A German bacteriologist. Born at Frankfort-on-Oder, June 24, 1852, he was educated at Würzburg and Berlin universities. He became assistant to the imperial health office of Germany in 1879, staff physician in the Friedrich Wilhelm Institute in Berlin, 1884, and professor at Greifswald, 1888. In his special study, bacteriology, Loeffler not only made many brilliant discoveries, but he improved to a great extent the methods of research in use. In 1882 he announced the discovery of the bacillus of glanders, and in 1884 the bacillus of diphtheria, his most notable discovery. With other investigators he carried out a series of researches into foot and mouth disease and malaria. He died April 8, 1915. See Diphtheria.

Loess (Ger.). A fine-textured siliceous and calcareous earth, in some instances transported by the aid of water, in others by wind. A large part of N. China is covered by loess deposits, built up by the dust-laden winter winds coming from the desert plateau of Mongolia. The accumulated deposits are often over 1,000 ft. in thickness, and since loess is very porous and easily cut through, roads and rivers cross the region by intricate passages often shut in by almost vertical walls. It has the advantage, however, of being highly fertile, provided there is a good water supply. Its yellow, or brownish-yellow, colour has given

the names Yellow River and Yellow Sea. Large deposits of loess are also found in Central U.S.A. and Central Europe. Included in the latter are the famous black earth lands of S.W. Russia. These American and European deposits are the finer particles of glacial drift left by the ice sheets which once covered the N. of North America and N.W. Europe. *Pron.* lō-ess.

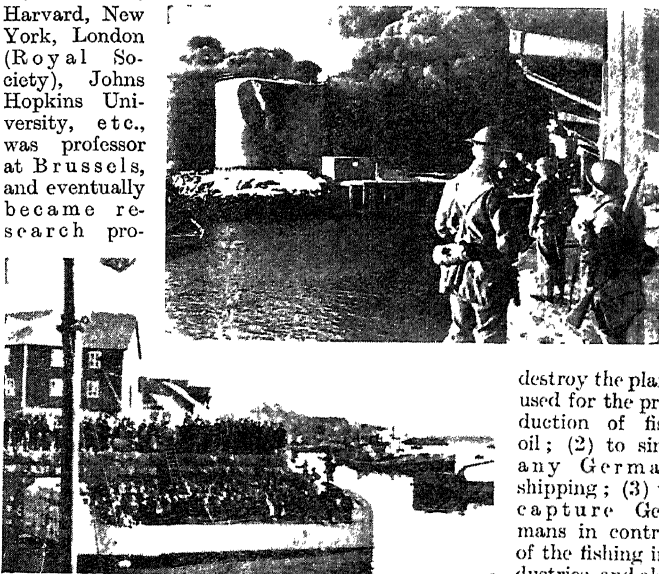
Loetschberg. Mt. and tunnel in Switzerland, in the Bernese Oberland. The tunnel leads from Loetschen Thal to Kandersteg, at an alt. of 884 ft. The Loetschen pass winds between the Balmhorn and the Schillhorn and Doldenhorn. It commands fine views of the Mischabel, Weisshorn, and Monte Rosa. The tunnel, nearly $\frac{1}{2}$ m. long, third in length in Switzerland, pierces the mountains at Kandersteg and finishes at Goppenstein in the Loetschen valley, the rly. continuing to Brig (*q.v.*) on the Simplon line. This is the shortest connexion between Berne and Milan.

Loewi, OTTO (b. 1873). German-American pharmacologist. A native of Frankfort-on-Main, born June 3, 1873, he was educated there and at the universities of Strasbourg and Munich. He was assistant professor of pharmacology at Marburg, 1900; at Vienna, 1905; and professor at Graz from 1909 until, as of Jewish origin, he was expelled by Hitler in 1938. He lectured at Harvard, New York, London (Royal Society), Johns Hopkins University, etc., was professor at Brussels, and eventually became research pro-

fessor of pharmacology at the New York university college of medicine in 1940. He was awarded the Nobel prize for medicine, jointly with Sir Henry Dale (*q.v.*), in 1936, and the Cameron prize, Edinburgh, 1944.

Lofoten Islands. Two groups of islands off the N.W. coast of Norway, to which they belong. They are situated in the Arctic Ocean between lat. $67^{\circ} 30'$ and $69^{\circ} 20' N.$, and are separated from the mainland by the West Fiord. Andø, Langø, and Hinderø are sometimes known as the Vesteraalen Islands, and the remainder, Moskenæsø, Flakstadø, and E. and W. Vaagø, Lofotodden, Værø, etc., as the Lofoten Islands proper. The largest is Hinderø, and the northernmost Andø. Between Lofotodden and Værø is the Maelstrom (*q.v.*). The islands are mountainous, with deeply indented shores. The climate is relatively mild, but subject to sudden storms. The neighbouring waters teem with herring and cod, and form one of the most prolific fishing grounds in the world. There are no large towns, but several ports of call and fishing stations. Cattle rearing is carried on to a limited extent, and dried fish and fish guano are exported. Total area, 1,565 sq. m.

On March 4, 1941, British Commando troops and Norwegian marines landed on E. Vaagø from light units of the Royal Navy. They had three objectives: (1) to



Lofoten Islands, Norway. An invasion barge, loaded with British Commando troops and Norwegian recruits, leaving after the raid on these islands in March, 1941. Top picture, oil wells burning after being detonated

destroy the plant used for the production of fish oil; (2) to sink any German shipping; (3) to capture Germans in control of the fishing industries, and also local quislings. The Germans were taken

completely by surprise, and all these tasks were carried out with conspicuous success. In this raid, invasion barges were used for the first time by the British. A more extensive raid by British and Norwegian units took place on Dec. 29. Landing unopposed at four different points, the Allies remained in control of the islands for three days, destroying much German equipment.

Loftie, WILLIAM JOHN (1839-1911). British antiquary. Born July 25, 1839, at Tanderagee, Armagh, N. Ireland, he was educated at Trinity College, Dublin, and ordained 1865. He became assistant chaplain at the Chapel Royal, Savoy. Travel in Egypt made him a keen Egyptologist, but he is better known as a writer on London. Of his many books on that subject his *History of London*, rev. ed. 1884, is his most important work. He also wrote on art and architecture. A founder of the society for the protection of ancient buildings, he died June 16, 1911.

Loftus. Urban dist. of the N. Riding of Yorkshire, England. It is 11 m. by rly. N.W. of Whitby. There is a town hall and public library. S. Leonard's church is a modern building. The chief industries are ironworks and stone quarries. Pop. 7,631.

Loftus, DUDLEY (1619-95). Irish jurist and Orientalist. He studied at Dublin and Oxford, represented Naas, co. Kildare, in the Irish house of commons, 1642-48, became admiralty judge, 1654, master in chancery, 1655, and was again an Irish M.P., 1659-95. He supplied the Ethiopic version of the N.T., with Latin translation, for Walton's Polyglot Bible, 1657; latinised the Armonian psalter, 1661; and published several ancient liturgies, 1693. Of his 128 MSS., in Armenian, Syriac, and other languages, many are in the British Museum, Oxford, and Dublin. He died in June, 1695.

Loftus, MARIE CECILIA (1876-1943). British actress, usually known as Cissie Loftus. She was born in Glasgow, on Oct. 22, 1876, educated at a Blackpool convent; she made her London debut at the Oxford music hall, 1893, where she scored an immediate success. A brilliant mimic, she played in



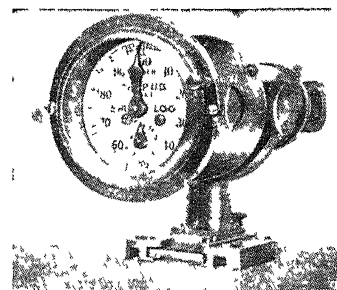
Cissie Loftus,
British actress

vaudeville and comic opera, and was Irving's leading actress at the Lyceum in 1902. Other notable performances were as Peter Pan, 1905; Nora in *A Doll's House*, 1911; Desdemona in *Othello*, 1913. Thereafter she lived chiefly in the U.S.A., where she taught elocution, and appeared in a screen version of *East Lynne*, 1931. She died in New York, July 12, 1943. Her first marriage (1894-99) was to J. H. McCarthy (q.v.).

Log. Apparatus used to measure the speed of a ship through the water. The simplest kind consists of the log ship, log line, log reel, and log glass. The first is a flat wooden board, triangular in shape, and weighted with lead ballast to keep it vertical. Two holes are provided at the corners, through which are fastened the end of the log line, and a bone peg attached by means of a span to the log line. The log ship is thrown overboard at the stern of the ship, and the line paid out from the log reel. The line is marked with knotted cord at intervals of 47 ft. 3 ins. for use with a 28-second log glass, each interval being subdivided. The length chosen bears to a nautical mile the same ratio as 28 seconds do to one hour, and so allows the speed of the ship to be read off immediately in knots as the line is paid out. The log glass is similar to an ordinary hour glass.

A taffrail log records the actual distance passed through by the ship in a particular time. It consists mainly of a rotator, similar to certain types of spinners used in fishing, and a registering apparatus to which the rotator is attached by the log line. The revolutions of the rotator when towed through the water are transmitted by the log line to the register on the taffrail, the dial of which indicates the distance travelled. In the latest type, the log register is fitted with an electric contact maker and wired up to a receiver, a device which enables a log reading to be taken in the chart house for comparison with charted depths.

The use of the log is first known from the writings of Purchas in 1607. See Knot.

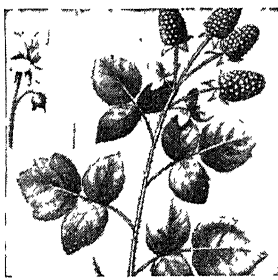


Log. Rotator of Cherub mechanical log. When dragged through the water the vanes cause the log to rotate, its revolutions being recorded on the register shown above
By courtesy of Thos. Walker & Son, Ltd., Birmingham

Logan. A mountain of N.W. Canada. A peak in the Rocky Mts., in the Yukon territory, near the Alaskan border, 20 m. N.E. of Mt. St. Elias, it is the highest mt. in Canada, and with the exception of Mt. McKinley, the highest in N. America. Its height is 19,539 ft.

Logan, JOHN (1748-88). Scottish poet. Born at Soutra, Midlothian, and educated at Edinburgh university, he became minister of South Leith. He occupied his leisure with literary work and historical lectures, and in the compilation of a collection of hymns and paraphrases, many written by himself, for public worship. In 1783 his tragedy of *Runnemed* was produced in Edinburgh. In 1786 he came to London, where he died, Dec. 25, 1788. As a lyric poet Logan

sometimes touches a high note. The best of his pieces is the *Ode to the Cuckoo*, a favourite in anthologies, which he was long accused of having appropriated from his friend Michael Bruce. Recent research, however, has tended to confirm the authenticity of Logan's authorship.



Loganberry. Leaves, fruit, and (inset) flower of the shrub

Loganberry. Hardy fruit-bearing shrub of the family Rosaceae. A native of America, it was introduced into Great Britain about 1900. The berries are

brownish red in colour, and the plant is stated to be a hybrid between blackberry and raspberry. The culture is as for raspberry, but the shoots should be trained to stakes, and cut back after fruiting.

Logan Stone or Rock. Large stone so nicely balanced that it can be rocked by a touch of the hand. The most famous in Great Britain is some 8 m. S.W. of Penzance, Cornwall. It is connected with the cliff castle of Treryn, which is formed of a mass of rocks. The rocking or "logging" stone, estimated to weigh over 65 tons, was thrown down from its pivot in 1824, the perpetrator of this dangerous prank paying for its replacement.

Logarithm (Gr. *logos*, ratio; *arithmos*, number). Arithmetical function tabulated for use in shortening calculations. It enables multiplication and division to be done by adding and subtracting the tabulated logarithms ("logs") for the numbers in question; involution and evolution are similarly carried out with ease and swiftness.

Though the discovery of logarithms is often attributed to Napier of Merchiston, who originated the name logarithm, the discovery seems to have been made independently by Napier and the Swiss watchmaker Jobst Burgi (1552-1632) within a few years of each other. Napier published his tables in 1614; these were what we now call hyperbolic logs, adapted to the computation of trigonometrical values in navigation by the stars. Napier's base or starting point for his logs was the number 2.71828 (for which the present-day symbol is e); Burgi's base was 1.0001. But the base for "common" logs is 10: not long before his death, in 1614, Napier realized that the base 10 would be more practical. He explained this to Henry Briggs, Gresham professor of mathematics, who published log tables to base 10 for the numbers up to 1,000 (in 1618); six years later Briggs issued tables for 1-20,000 and for 90,000-100,000. These were taken to 14 places of decimals. Many later sets of tables were published; some textbooks include tables for 4 places of decimals, giving sufficient accuracy for ordinary calculations.

Commercial interests led immediately to the wider application of logs, in calculating compound interest, etc. The invention marked one of the greatest forward

steps in practical mathematics. The log of a number to a given base is the index of the power to which the base must be raised to equal the number. As an example, $10^2 = 100$. 10 is called the base, 2 is the logarithm of 100 to that base, and the relation is written $\log_{10} 100 = 2$. Any base may be taken, but in practice only two are used, 10 for common logarithms, and e , 2.71828. Logarithms to the base e are known as Napierian or natural logarithms. Unless otherwise stated, common logarithms are always meant.

The logarithms of most numbers are incommensurable, and an approximate value has to be found. Thus the logarithm of 200 is 2.30103 to five places of decimals. The integral part of a logarithm is called the characteristic and the decimal part the mantissa. The characteristics of positive numbers less than 1 are negative, those of numbers between 1 and 10 zero, and over 10 positive. An advantage of common logarithms is that the mantissa is the same for all numbers having the same sequence of figures, the characteristic only altering. Thus $\log 242 = 2.38382$; $\log 2.42 = .38382$; $\log 24200 = 4.38382$, etc. The co-logarithm of a number is the logarithm of the reciprocal of the number; and the anti-logarithm is the number corresponding to the logarithm. See Indices; Powers; Mathematics; Slide Rule.

Logarithmic Sector. Device used in quantitative analysis of metals and other materials by spectrographic methods. All quantitative spectrographic methods depend on the facts that the emission of light by any particular element, when burned, is of definite wavelengths, and that its intensity is proportional to the amount of that element present. Thus if its spectrum is photographed and the density of certain spectral lines is measured, a close estimate of the composition of a material can be made. Scheibe simplified this by introducing a rotating sector between the light source and the slit of the spectrograph. This sector is cut away on a logarithmic curve and so the spectrum line is given

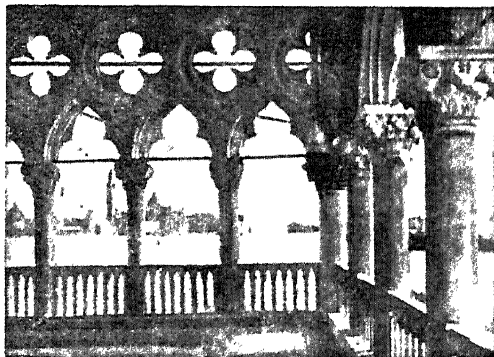
a varying exposure along its length. Measurement of the length of a line gives an indication of its intensity and so of the proportion of the particular element present.

Log Book. Diary or journal of a ship's voyage. It records the rate of progress according to the log, the course steered, and all other important details. The incidents as they occur are noted by the officer on watch in the bridge or deck log book, and daily transcribed into the official or ship's log book by the navigating officer in charge. When a man commits a misdemeanour, his name is entered in the log book, together with particulars of the offence and the penalty attached, and he is said to be logged. Hence the expression to log a man is used in the sense of to fine.

Various log books are also carried, under international law, by service and commercial aircraft; others are normally retained at unit headquarters, or in civil flying, by the operators. The most important is the pilot's log, a personal document which must be completed in detail after every flight.

In Great Britain the owner must be in possession of a log or registration book for each motor vehicle. In this is recorded the principal data and history of that vehicle, including changes of ownership and licensing. More detailed logs are maintained by motor drivers in the services.

Loggia (Ital.). An open gallery embodied in the side of a building, so as to form a shelter. In combination with column and open arch, it is a characteristic feature of Italian architecture, medieval and modern, and is frequently employed by the designers of modern British country houses. A verandah is a form of loggia.



Loggia of the Doge's Palace, Venice, with view across S. Mark's Canal to the island of S. Giorgio

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